Atlas of



EARTH SCIENCES DIVISION

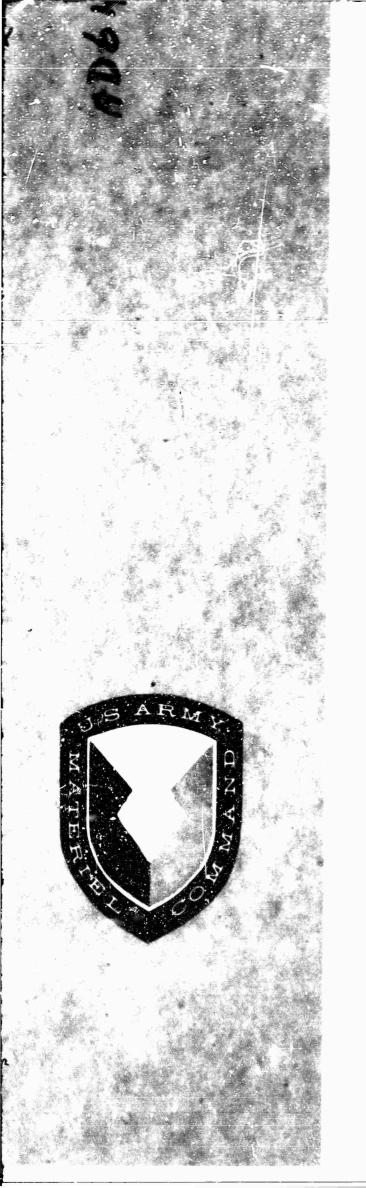
U. S. ARMY NATICK LABORATO

MEAN MONTHLY TEMPERATURES

TECHNICAL REPORT

ES-10

AUGUST 1964



EARTH SCIENCES DIVISION

U. S. ARMY NATICK LABORAT

NATICK, MASSACHUSETTS

TEMPERATURES

TECHNICAL REPORT

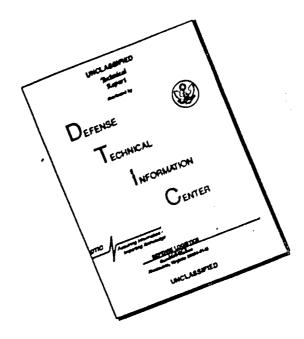
AUGUST 1964

ORATORIES



A MARINE BOOM

DISCLAIMER NOTICE



THIS DOCUMENT IS BEST QUALITY AVAILABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

All District Transformation (b) Sheet Activation (b

ERRATA

Line seven, second paragraph should read: The January and July sape

ATLASOF MEAN MONTHLY TEMPERATURES, ES-10

l ⇒ N	b.	
1		Southern coast of Scelend should fall within the 32 to 50 degree range See corresponding area on Map 25.
		Aloutians should fall within the 32 to 50 degree range, with higher elevations between 14 and 32 degrees.
		Color is missing from Numivek Island. It should be in the -4 to 14 degree range.
		Color is missing from The Faernes. They should be in the 30 to 50 degree range.
7 9 10		Color is missing from Bermude. It should be included in the 68 to 86 degree range.
11 12	}	Color is missing from Bermade. It should be included in the 50 to 68 degree range.
19		Small areas in the Andes should be shown with temperatures below 14 degrees as on Maps 15 and 20.
24		Small areas in southern Chile with temperatures below 32 degrees are outlined but are not appropriately colored.
45 46	}	Temperatures between 50 and 66 degrees should be shown at higher elevations in the Cenary Islands.
54		Two areas in central India are incorrectly colored. They should fall within the 68 to 86 degree range.

For word

Heat is basic to all the and ortivity. Temperature is an indicator of the relative degree of least. All design of material or place for human activities were consider the temperatures to be experienced. Major geographic difference over the earth are sourceful with temperatures to be experienced.

Rarly in World Was II, a group of geographers and climatelegists was brought impositor in the Questermanter 1 organism what out a realistic reverage protect the soldier at any time of the year, in any part of the world. It at once because apparent that there did not exact an adequate world enverage most elements obscious. One of the first tasks of the group, therefor, was to draw a sense of climater maps continent by continent. Starting in 1943, a series of month of every continent, and representative months on the oceans, was compiled by the Quartermoster group and published by Army May Neverse I been for the first arientalic clothing allowance some of the world, which were adopted as the official standard by the U. A. Army. To improve and review time tract was let with Clark University which resulted in 1948 in a series of 76 large-scale maps of temperature. These scape have been saided consistent involving environment. The January and June maps have been almost worn out. Because of the value of times maps, not only to the Army Motors climatelegists outside of the Army, it was feet desirable to publish them to permanent forms. Army Research (lifties made funds available for judicial accounts forms. Army Research (lifties made funds available for judicial accounts forms.)

This using the maps of mosts monthly temperatures for many purposes, the Earth Sciences Division and its predictions arrange have appreciated to infinitesian about temperature and have been qualified and jublishing more explanated studies, including entropy temperature, and review of instantaneous samples of elimates. Although them other types of date are useful for many purposes, the Earth Sciences Division does not wanted to make broad quantitative comparisons between different parts of the earth a surface term of climatic classification such as those of Koppen. Thorotheralite, and deletations, are bound upon the use of climatic mones, for example. Means a summation of approximate total amounts of energy involved during the period of time as in problems of month for requirements for heating. We increase, so in wagehouse, the temperature of the massive bulk is no stable and changes so little in the course of a day, that month —means provide a temperature collidation. If broad relative comparisons are minded, detailed cyclical data may actually be confusing. The forest may be observed by the tree-

Whatever the use to which they may be put, scientific or applied, it is hoped that these maps will provide a useful factual summary and a significant coliterature

Appreciation is organised to the Geography Department at Clark University that made the first drafts of these maps, to members of the Earth Scient.

Mr. Andrew Hastings, Sr. and Mr. Roland Fredigh, who revised the maps and brought them up to date, to the Army Map Service which did the final draft the Army Research Office which provided funds for publication.

The second secon

PEVERIL MER
Chinf
Earth Sciences Di

Foreword

hase to all life and activity. Temperature is an indicator of the solutive degree of least. All design of material or plans for human activity, whether malitary is other indicators over the earth are associated with temperature differences.

World Wer II, a group of prographers and classicologists was trought together in the Quartermaster Corps to work out a realistic system for cirching allowances to her at any time of the year in any part of the world. It at once became apparent that there did not exist an adequate world coverage month by month of critical form of the first tests of the group, therefore, was to draw a series of climater maps, continent by continent. Starting in 1943, a series of 90 maps covering every continent, and seprementative months on the oceans, was compiled by the Quartermaster group and published by Army Map Service. These moles remained the attentible dothing allowance against of the world, which were adopted as the official standard by the U.S. Army. To improve and refine these powering maps, a continuously which resulted in 1948 in a series of 76 large-scale maps of temperature. These maps have been used almost continuously to help wive military ing environments. The January and June maps have been almost worn out. Because of the value of these maps, not only to the Army Material Command. But sine to ustante of the Army, it was felt describe to publish them in parameter form. Army Research Office made 7. As available for publish at the geographers and if the Earth Economic Division, U.S. Army Netick Laboratories, revised the original maps and arranged for their publishation by Army Map Service in the present Atlas.

and its maps of mean monthly temperatures for many purposes, the l'arth Sciences Division and its previewesser groups have appreciated the need for other types of attaining extreme temperatures frequency duration microcliniatic conditions, and assessed samples of climates. Although these other types of data are useful for many purposes, the Earth Sciences Division does not wish to discovere the value of sees. Means continue to be useful where it is desired to make broad quantitative companions between different parts of the earth's surface. Most of the mixtern as a classification such as those of Koppen, Thornthwaite, and deMartonne, are based upon the use of climatic means, for example. Means also provide a convenient prevaimate total amounts of energy involved during the period of time as in problems of conth-by month fuel requirements for heating. Where material in the air wavehouses, the temperature of the massive bulk is so stable and changes so little in the course of a day, that monthly means provide a useful indication of their distions. If broad relative comparisons are needed, detailed cyclical data may actually be confusing. The forest may be obscured by the treve

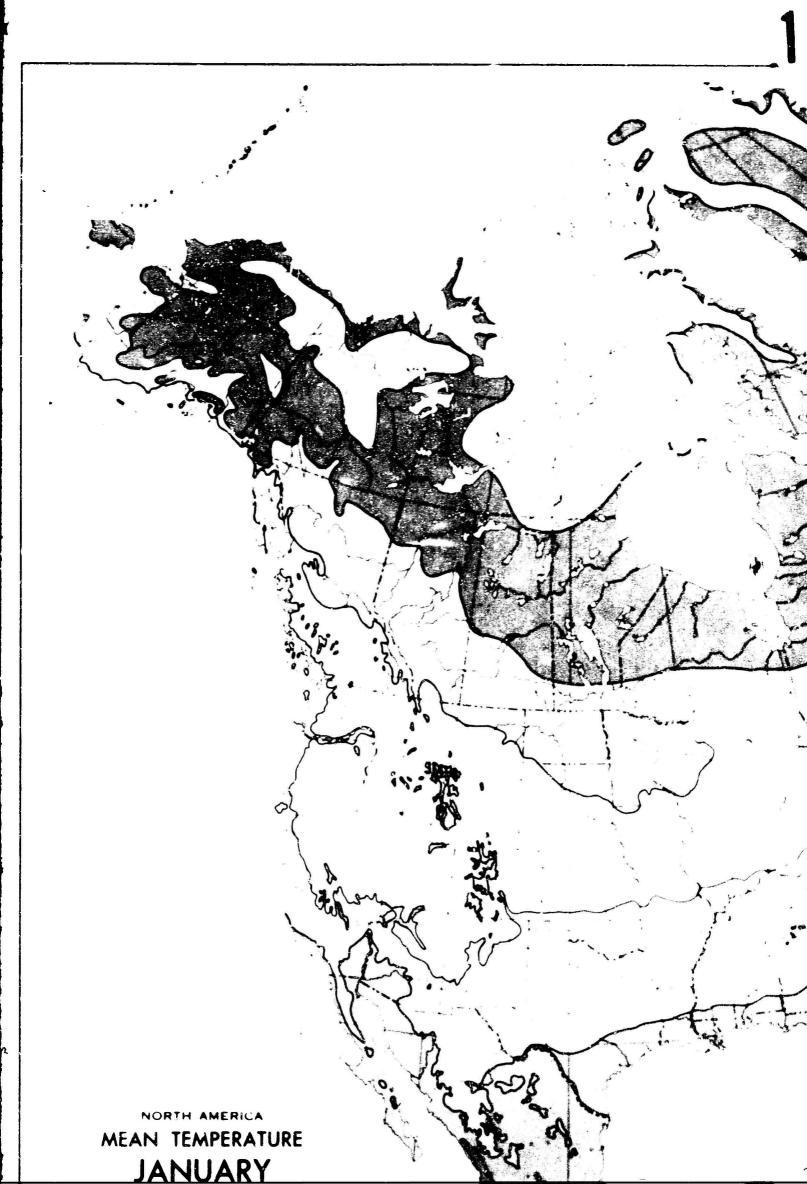
the use to which they may be put, accentific or applied, it is hoped that these maps will provide a useful factual summary and a significant contribution to climated signifi-

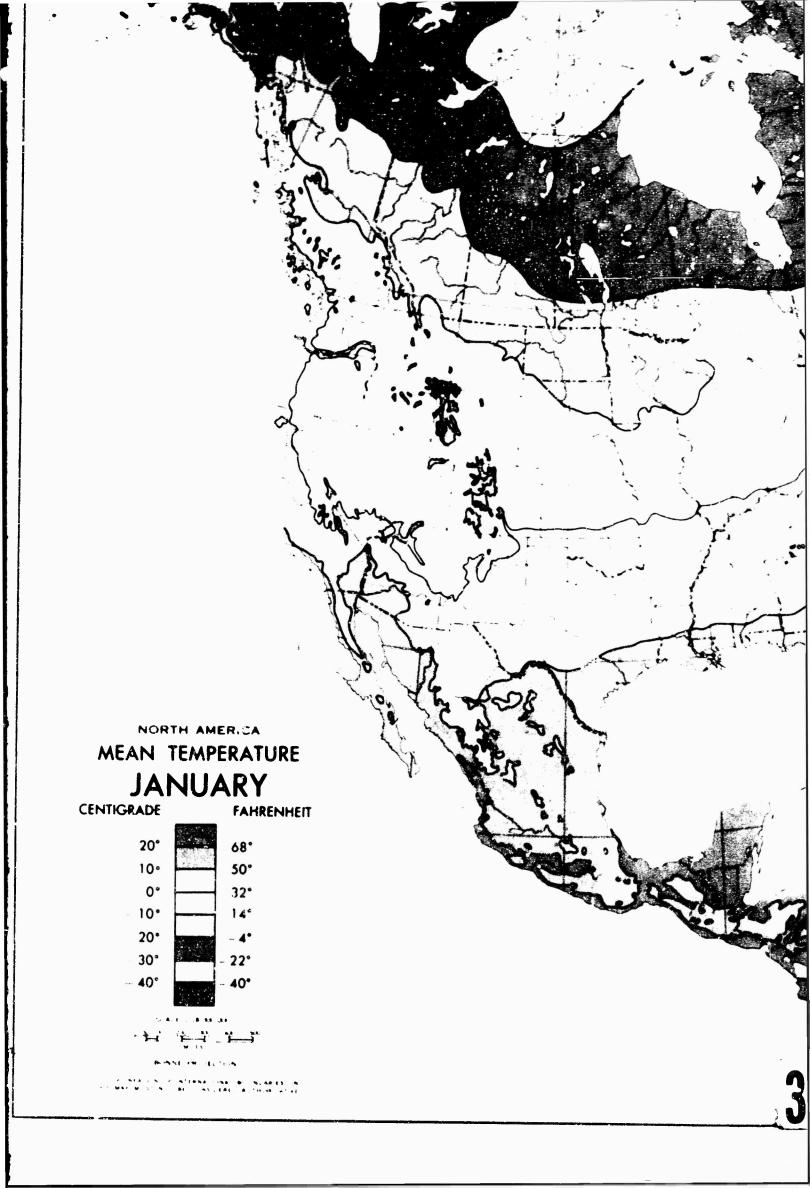
non is expressed to the Geography Department at Clark University that made the first drafts of these maps, to members of the Earth Sciences Division, particularly stings, Jr. and Mr. Roland Prodigh, who revised the maps and brought them up to date, to the Army Map Service which did the final drafting and printing and to each Office which provided funds for publication.

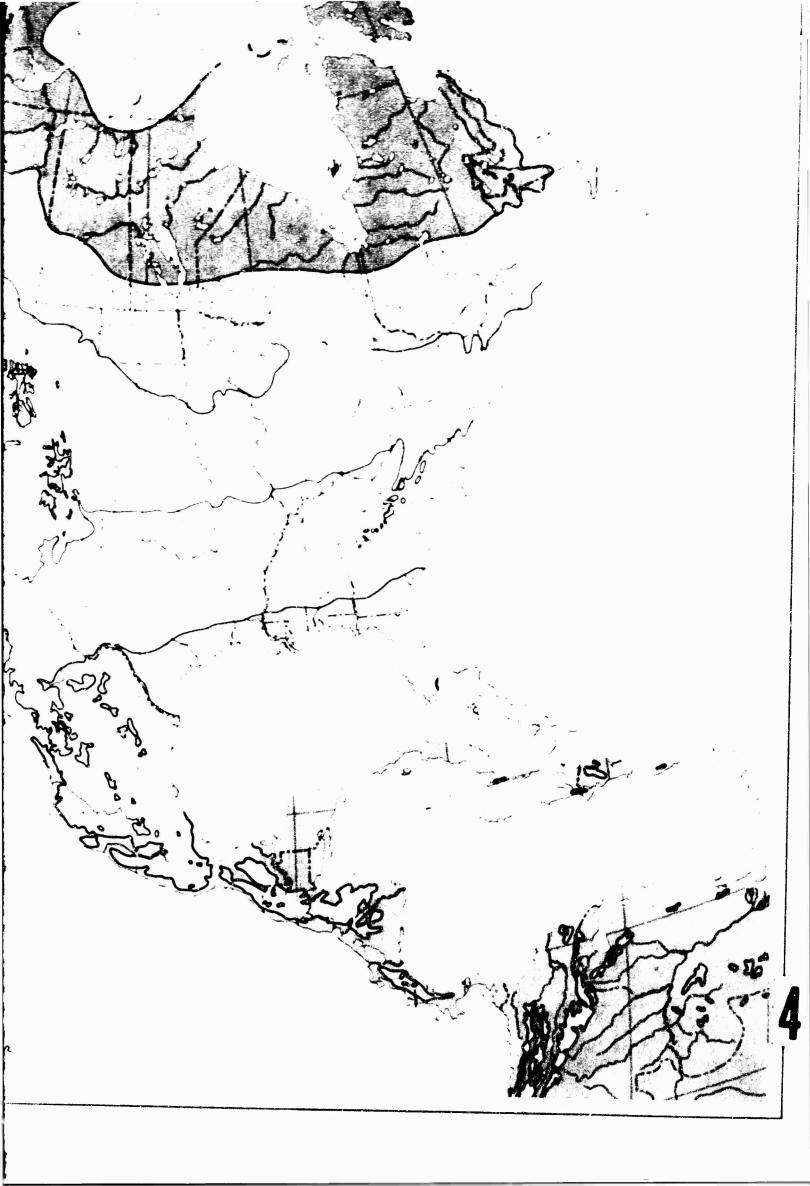
PEVERIL MEIGS, Ph D
Chief
Barth Stranger Division

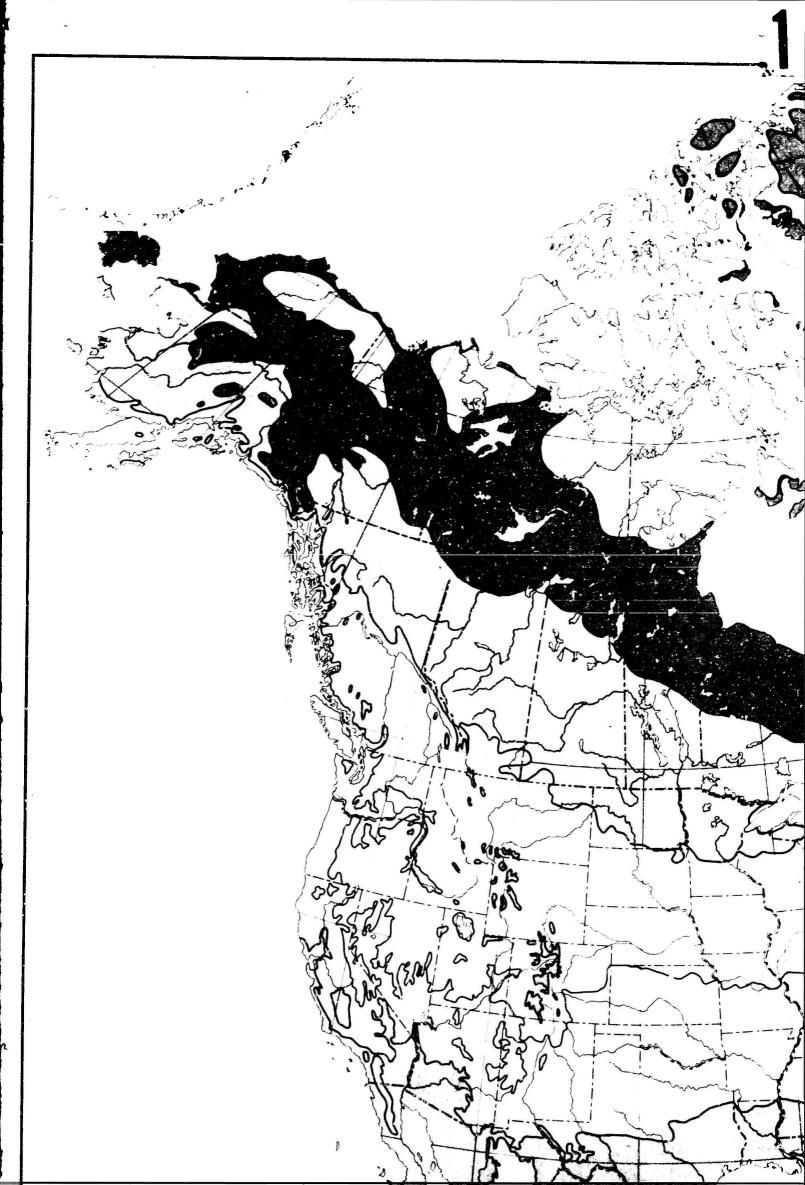
CONTENTS

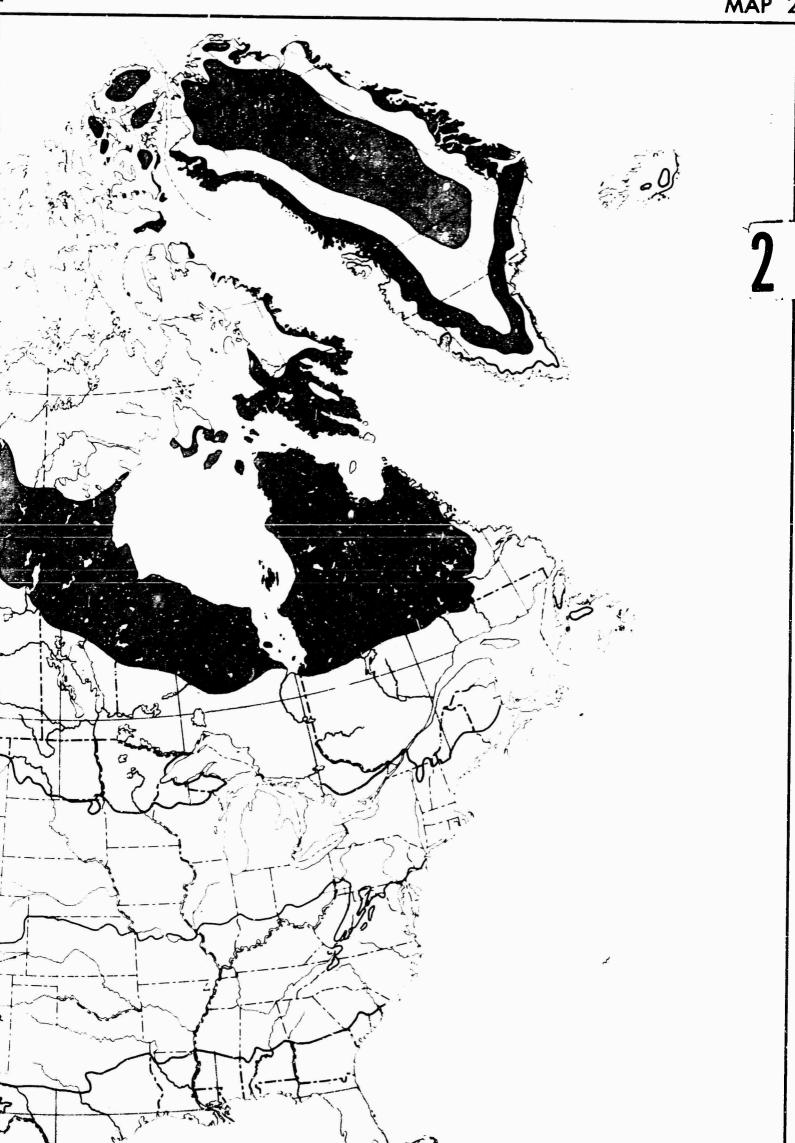
NORTH A	NORTH AMERICA		EUROPE		ASIA	
Month	Map No	Month	Map No	Month	Map No	
January	1	January	25	January	49	
February	2	February	26	February	50	
March	3	March	27	March	51	
April	4	April	28	April	52	
May	5	May	29	May	5.3	
June	6	June	30	June	54	
July	7	July	31	July	55	
August	8	August	32	August	56	
September	9	September	35	September	57	
October	10	October	34	October	% A	
November	11	November	35	November	5 9	
December	12	December	36	December	(4)	
SOUTH AMERICA		AFRICA		AUSTRALIA		
Month	Map No.	Month	Map No	Month	Map No	
January	13	January	37	January	61	
February	14	February	38	February:	62	
March	15	March	39	March	63	
April	16	April	40	Apni	64	
May	17	May	41	May	65	
June	18	June	42	June	66	
July	19	July	43	July	67	
August	20	August	44	August	68	
September	21	September	45	September	(2)	
October	22	October	46	October	70	
November	23	November	47	November	71	
December	24	December	48	December	72	

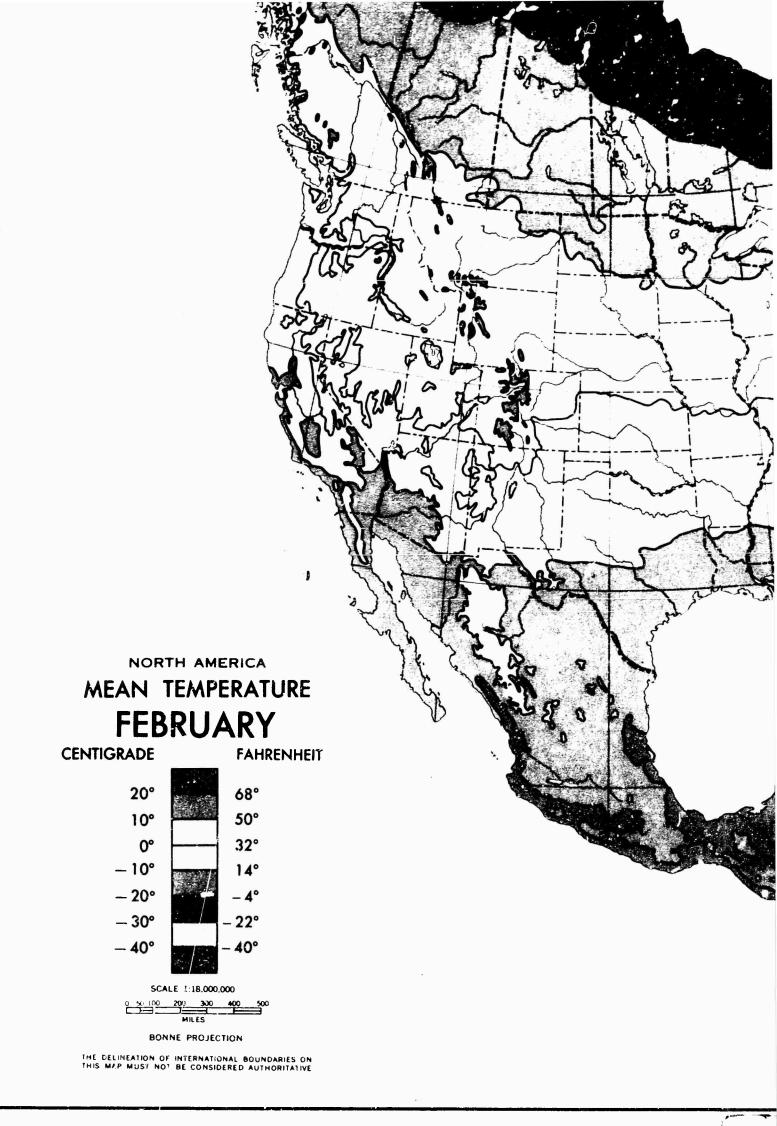


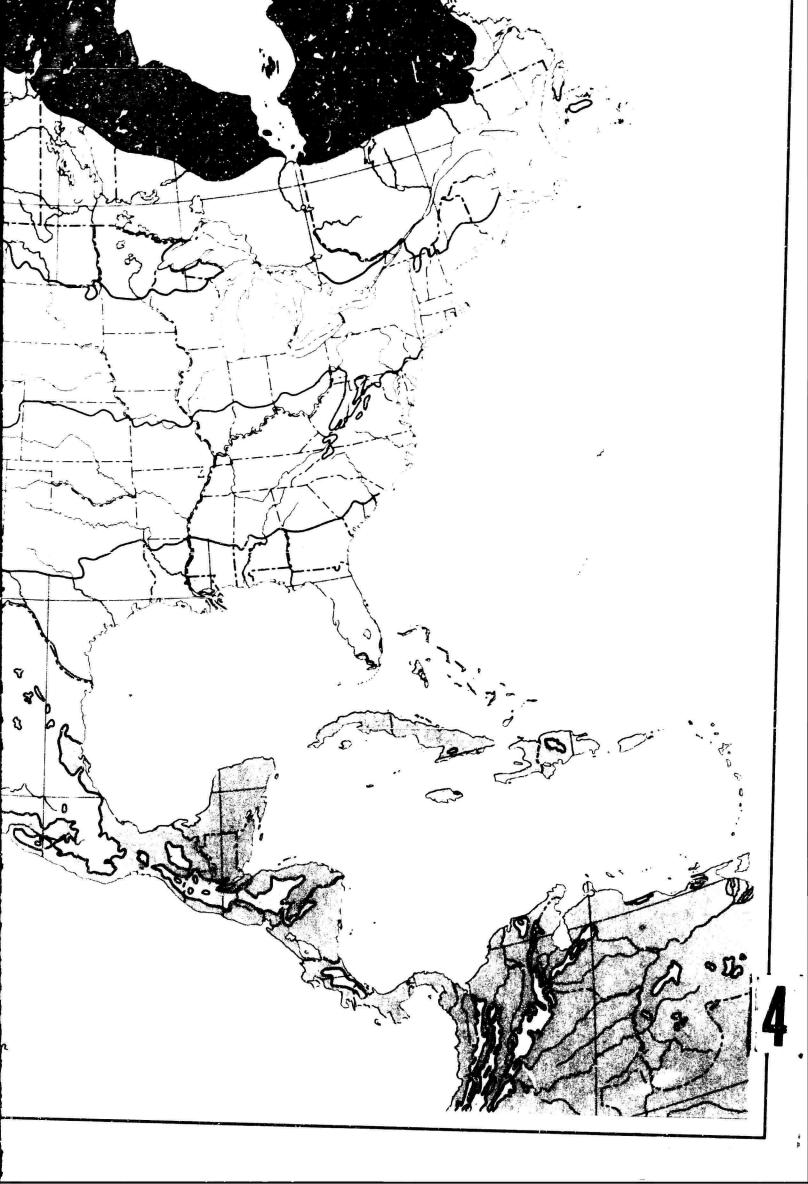


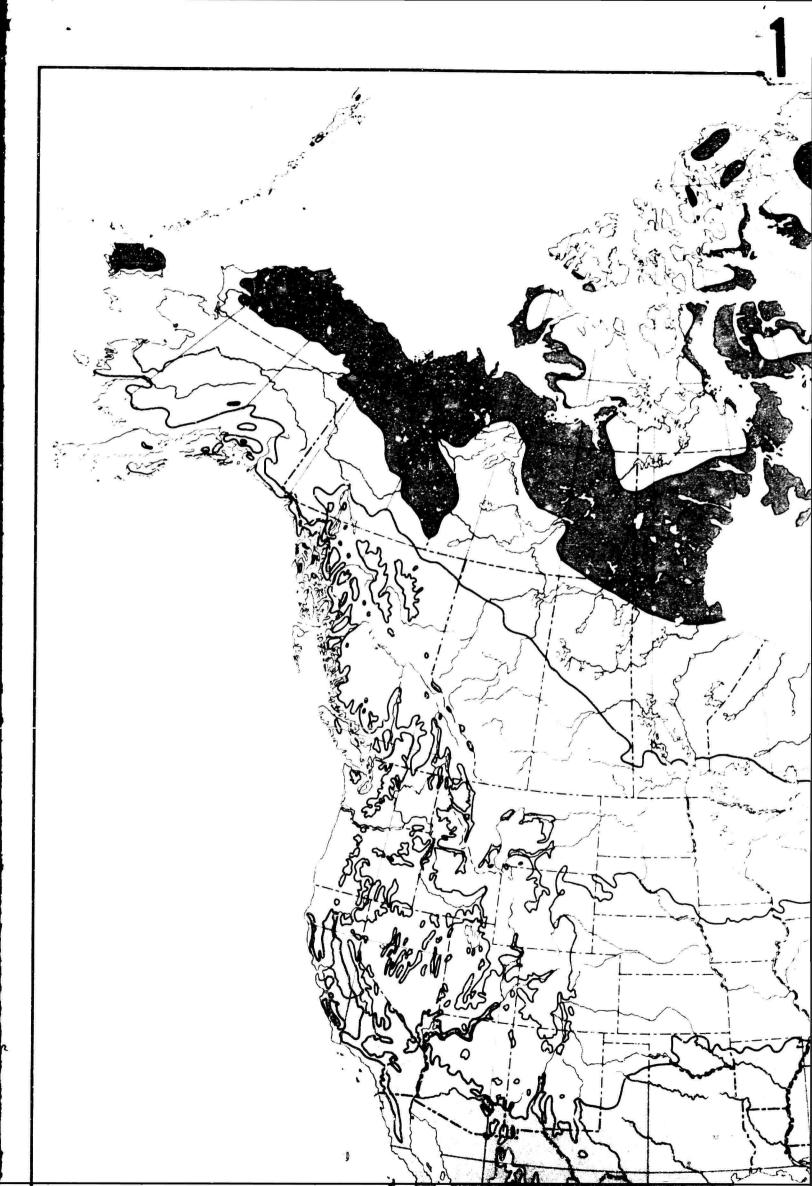


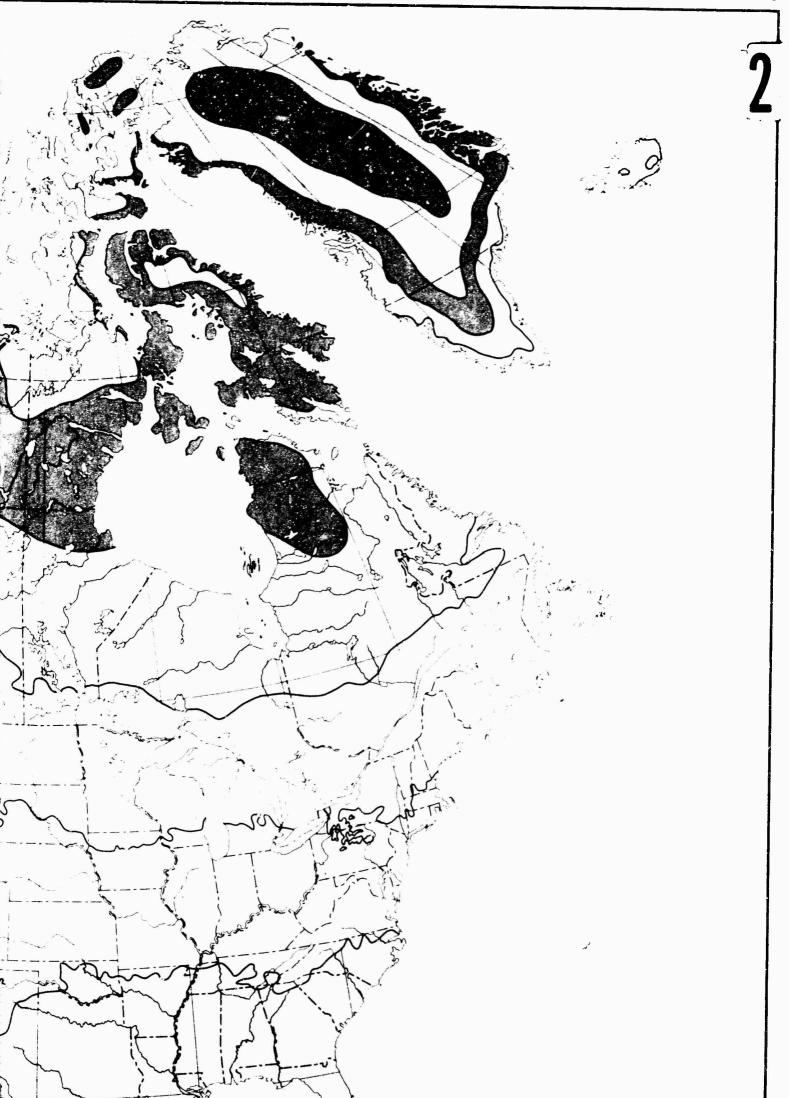


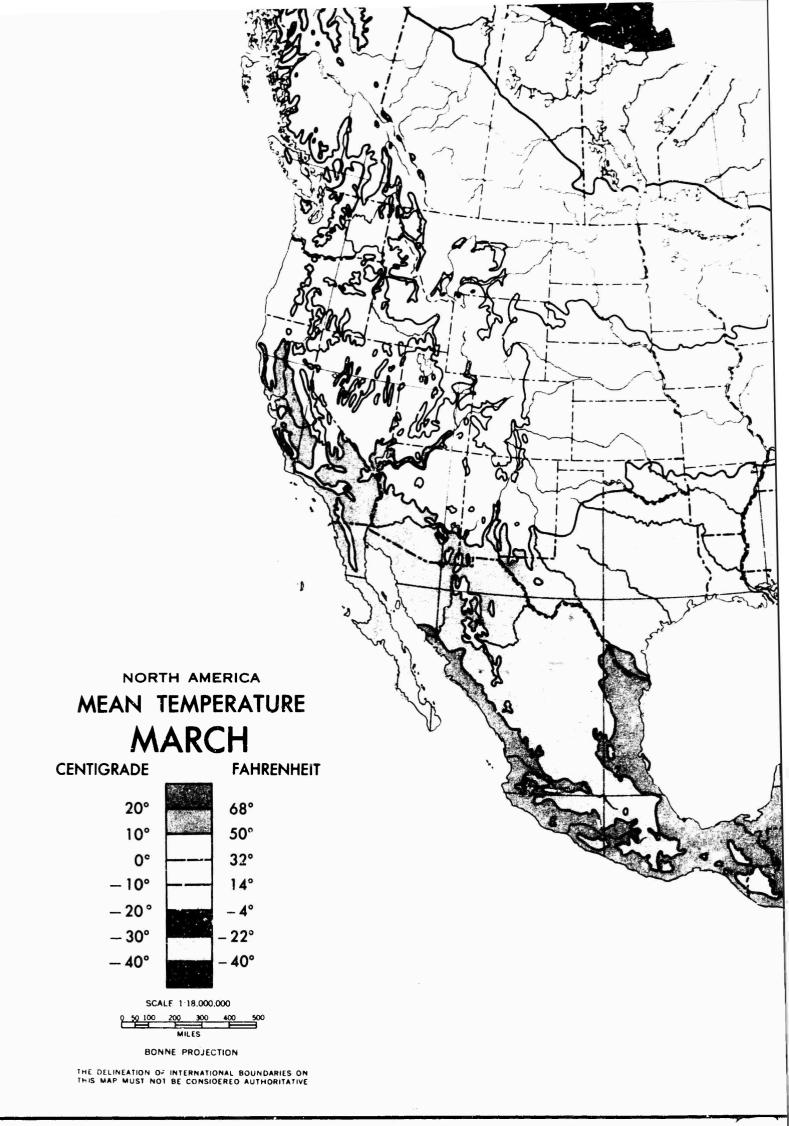


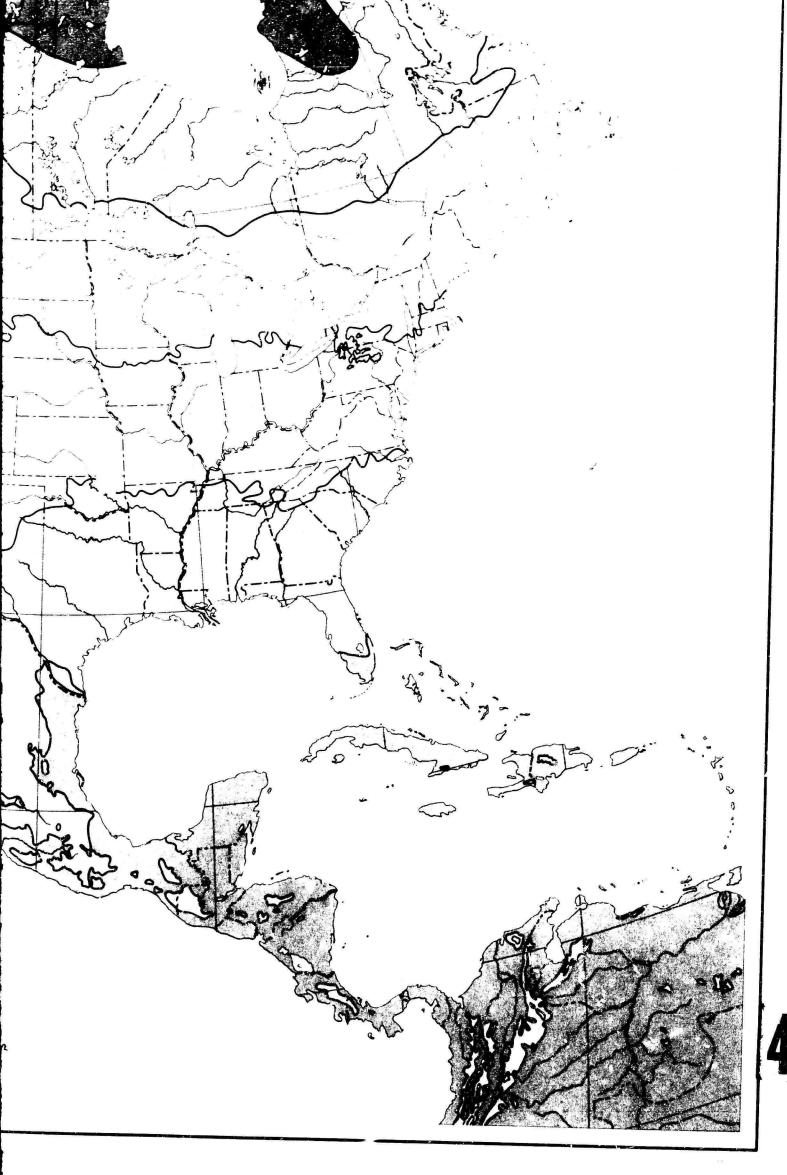


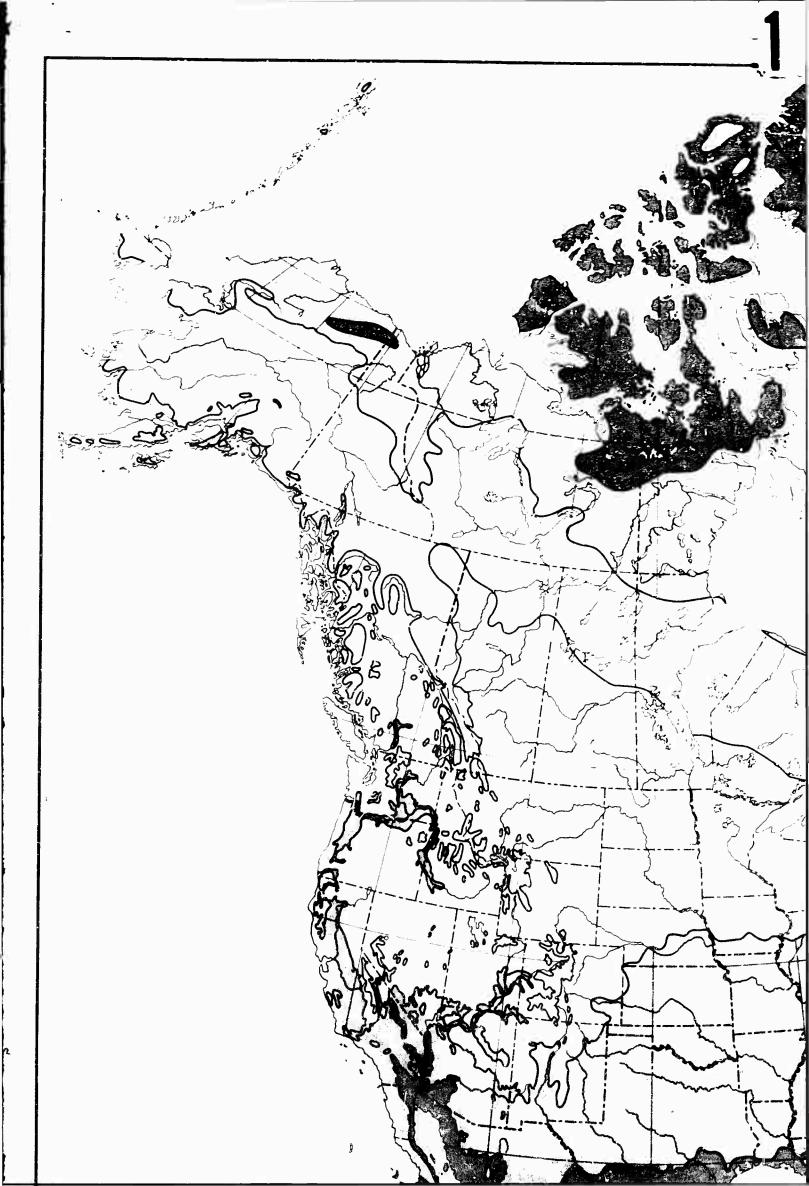


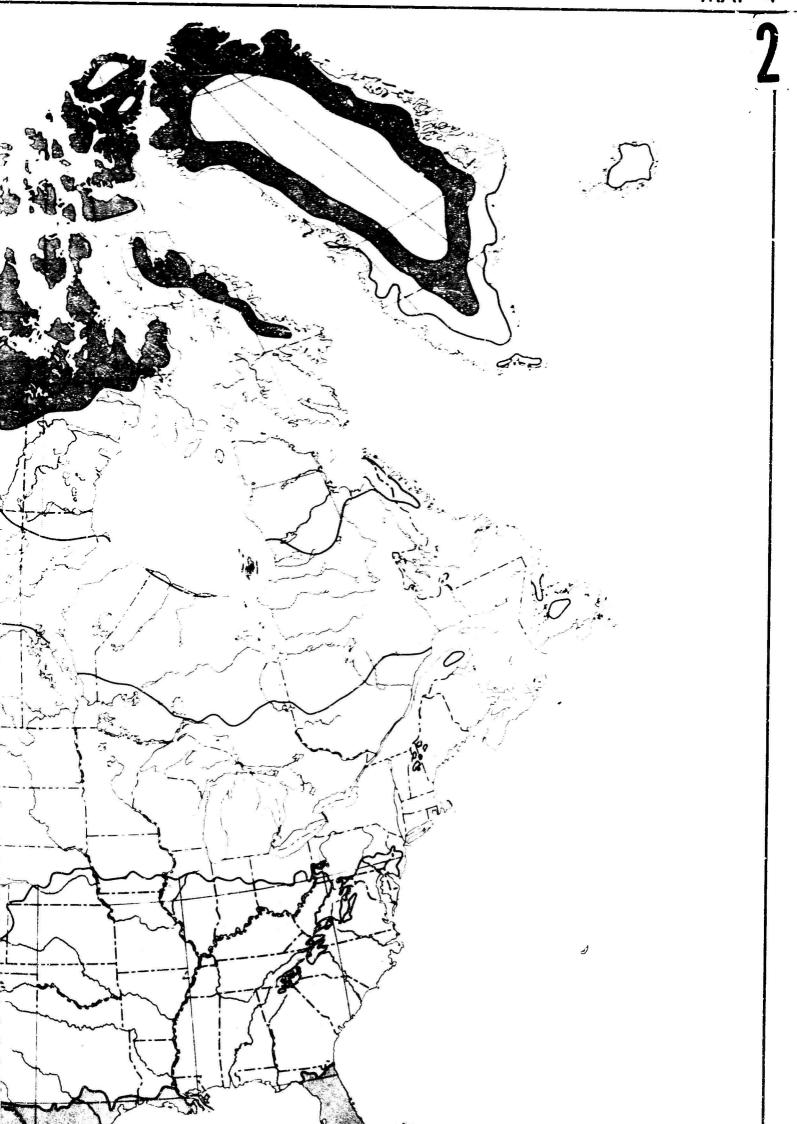


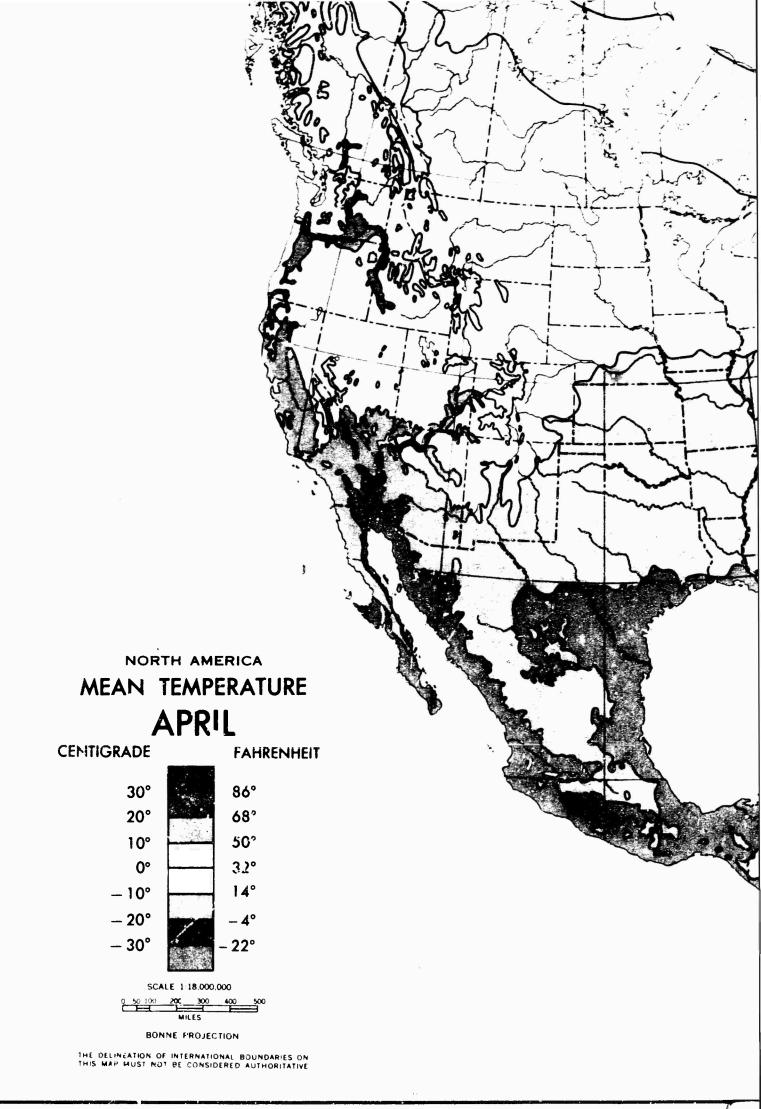


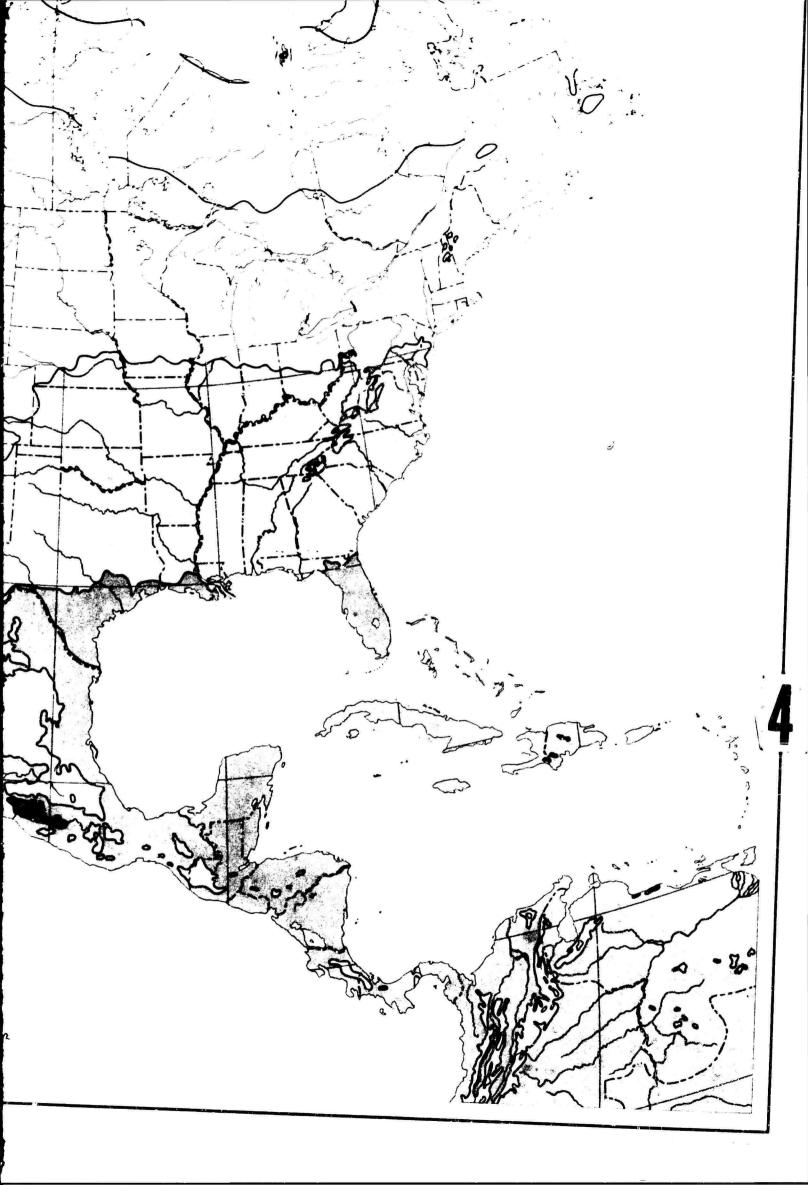


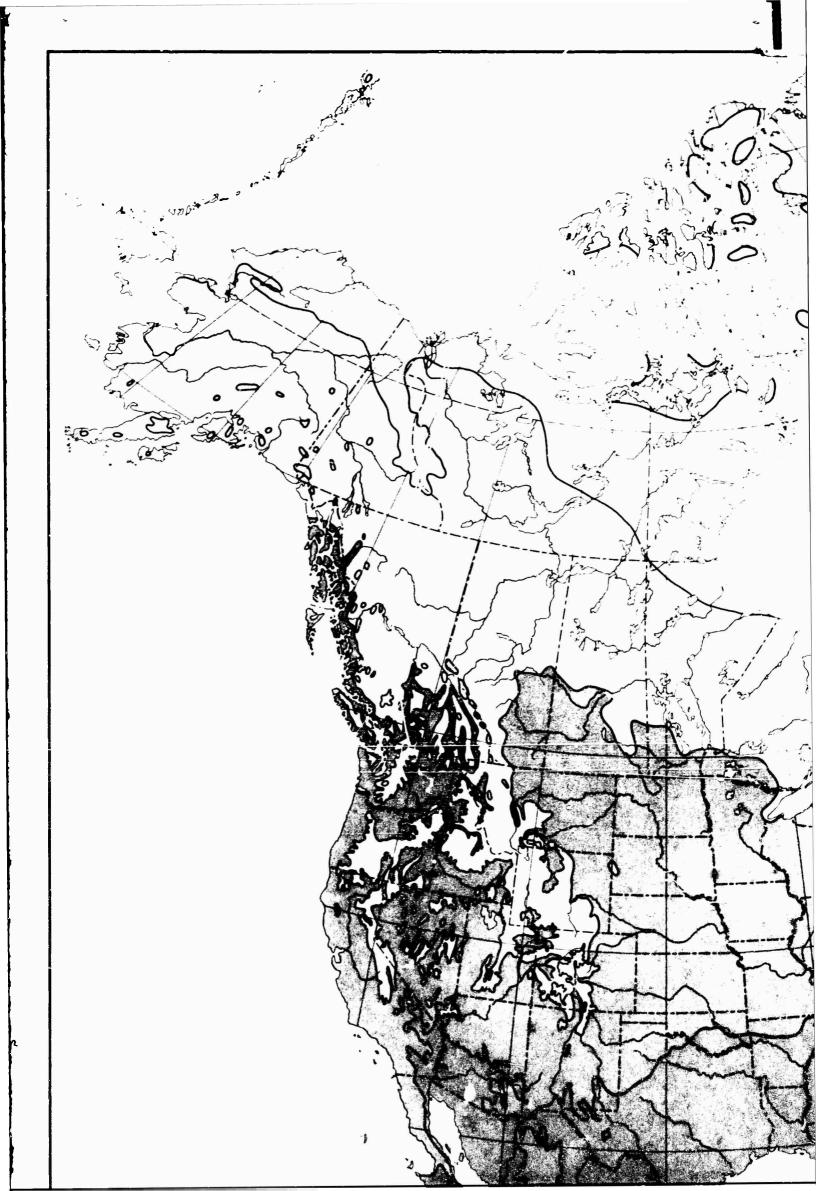


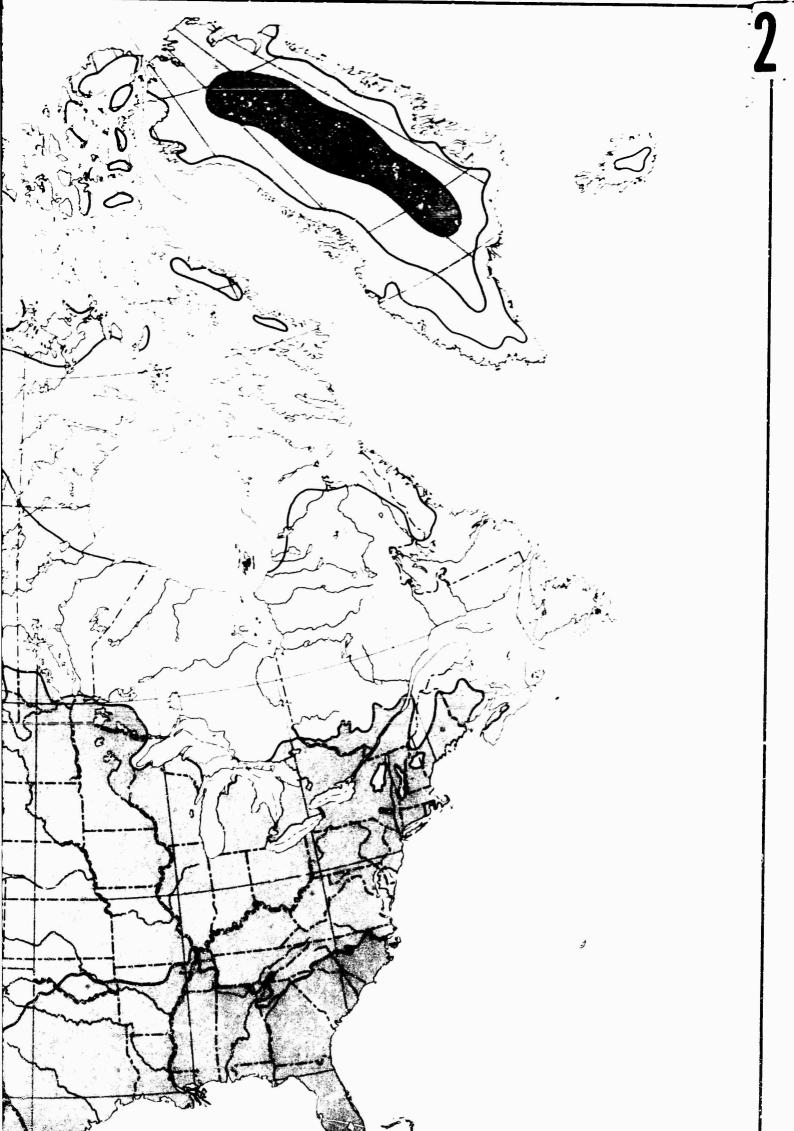


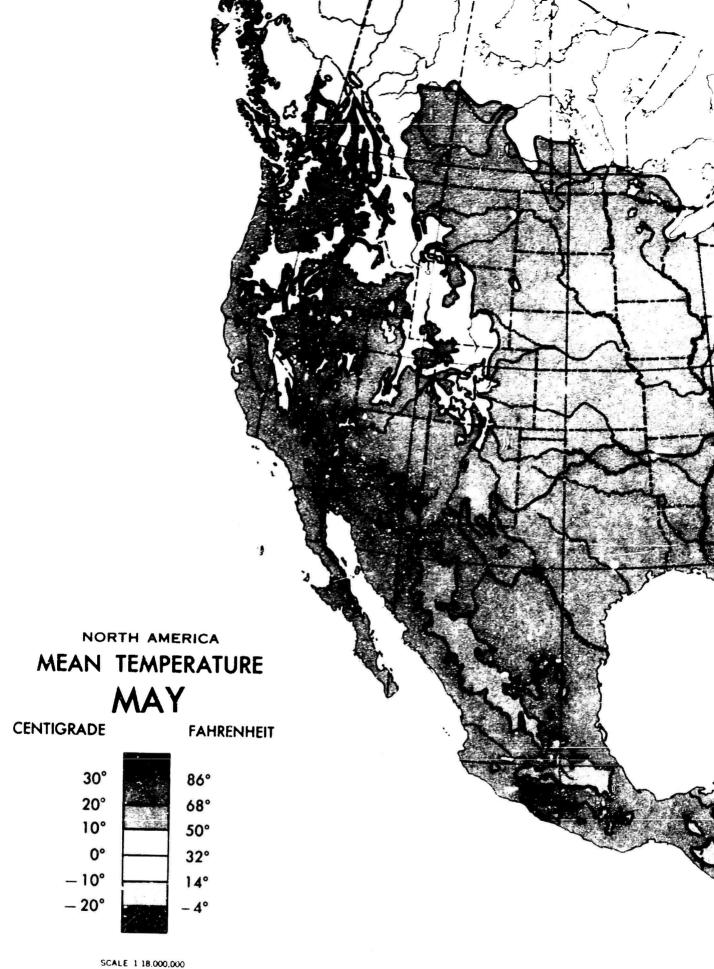


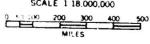






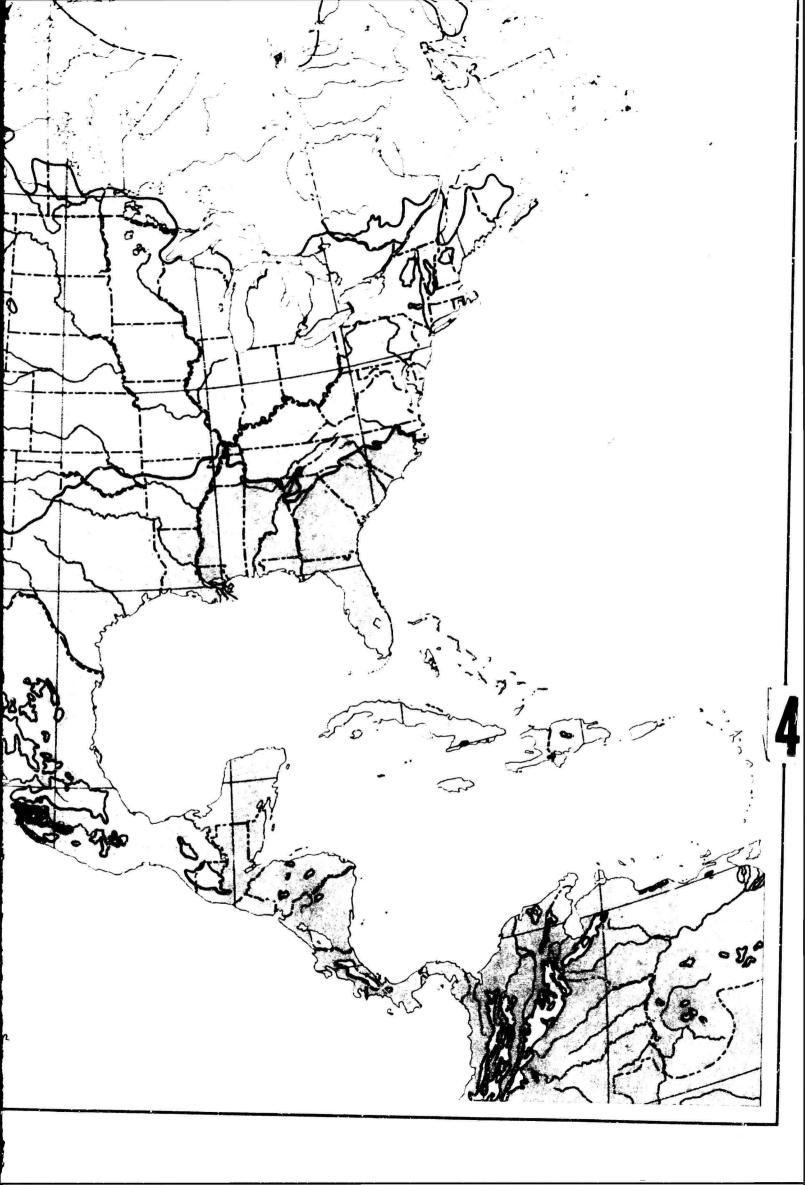


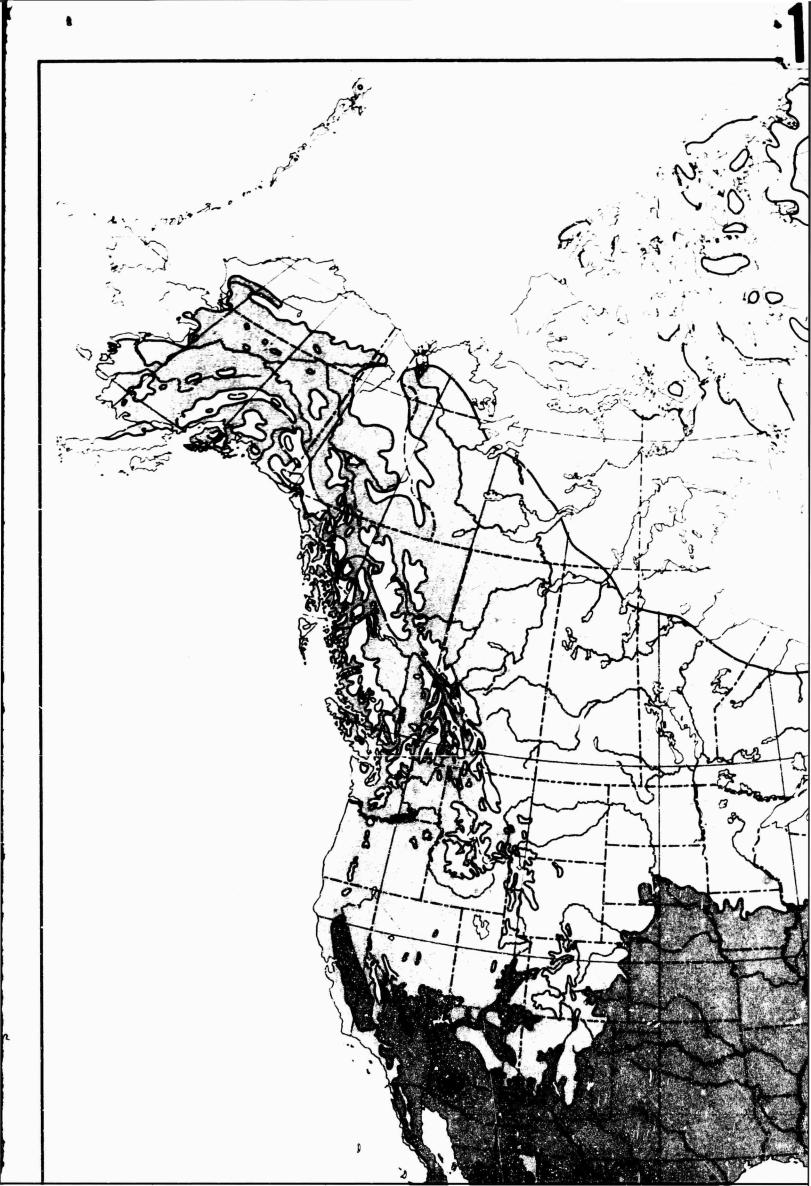


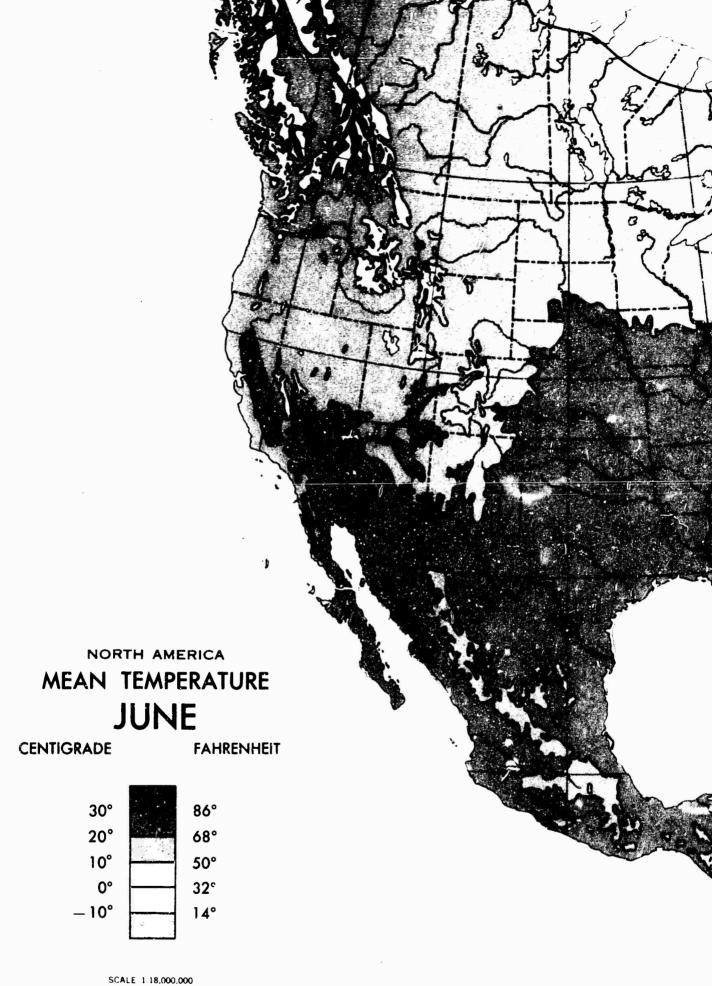


BONNE PROJECTION

THE DELINEATION OF INTERNATIONAL BOUNDARIES ON THIS MAP MUST NOT BE CONSIDERED AUTHORITATIVE



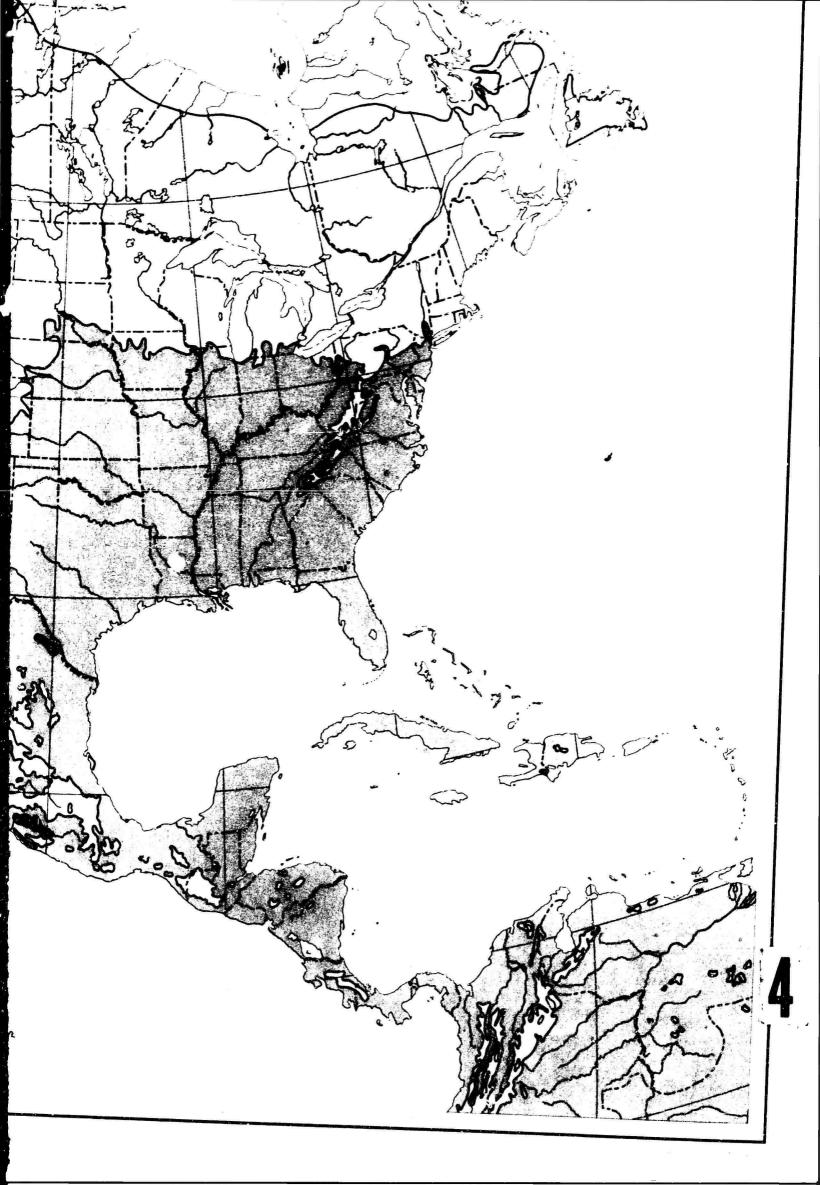


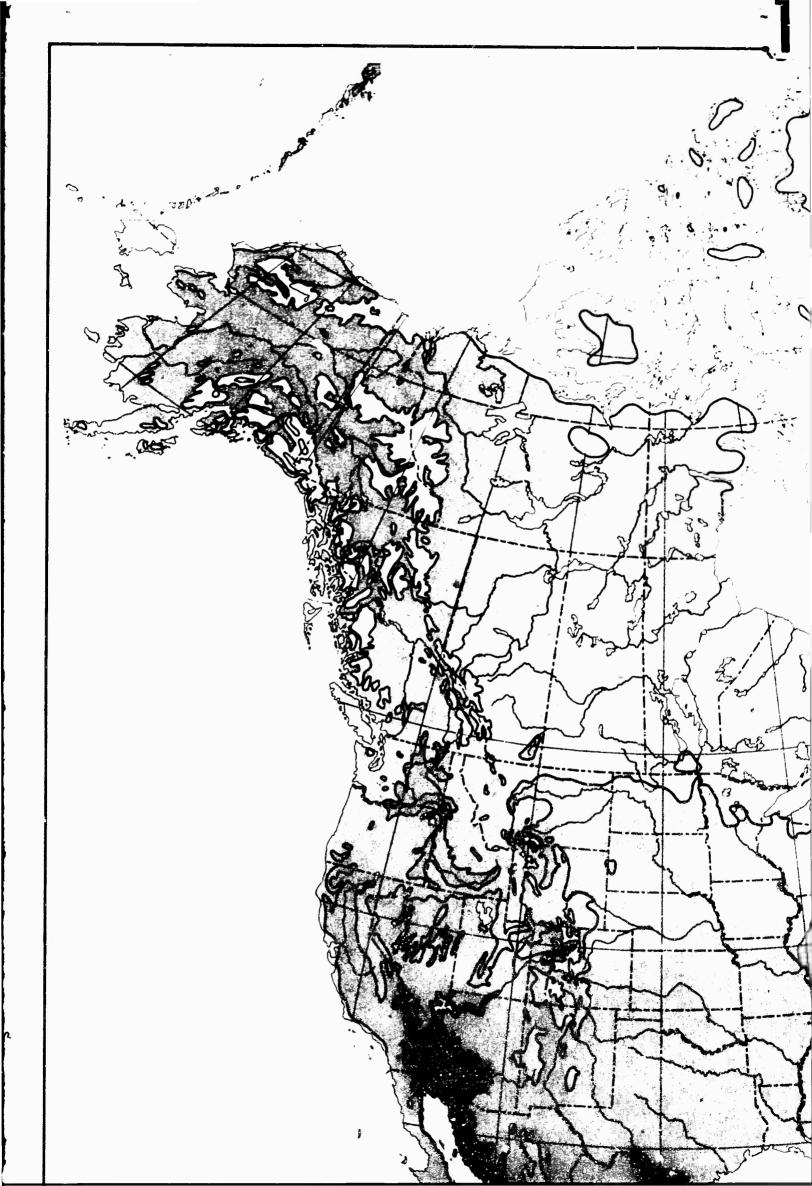


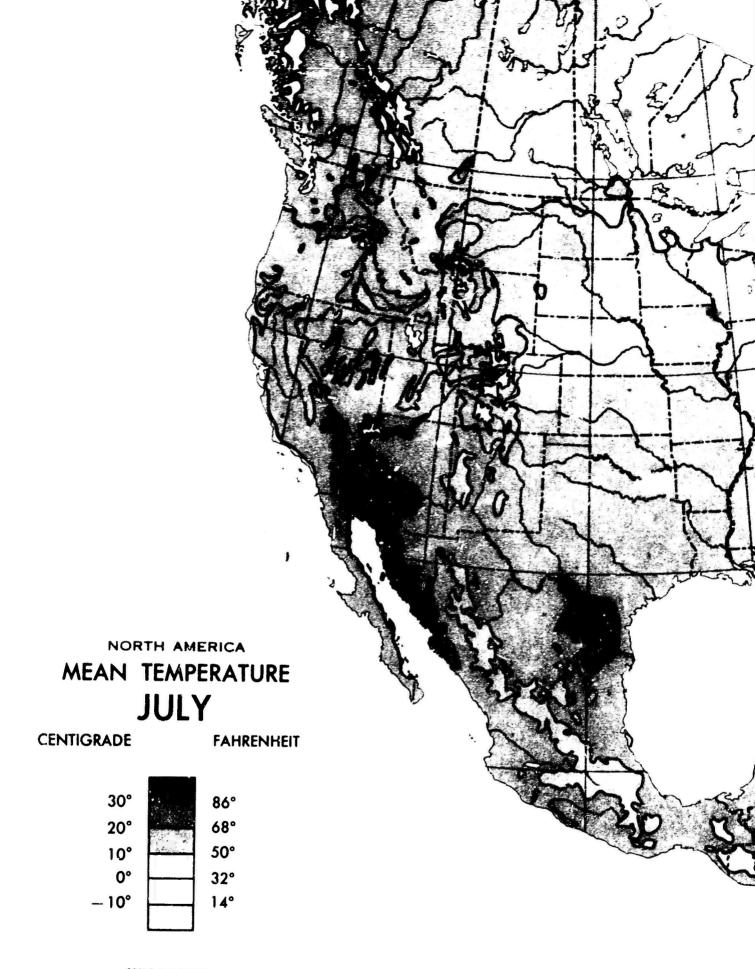
SCALE 1 18,000,000 0 50 100 200 300 400 500 MILES

BONNE PROJECTION

THE DELINEATION OF INTERNATIONAL BOUNDARIES ON THIS MAP MUST NOT BE CONSIDERED AUTHORITATIVE

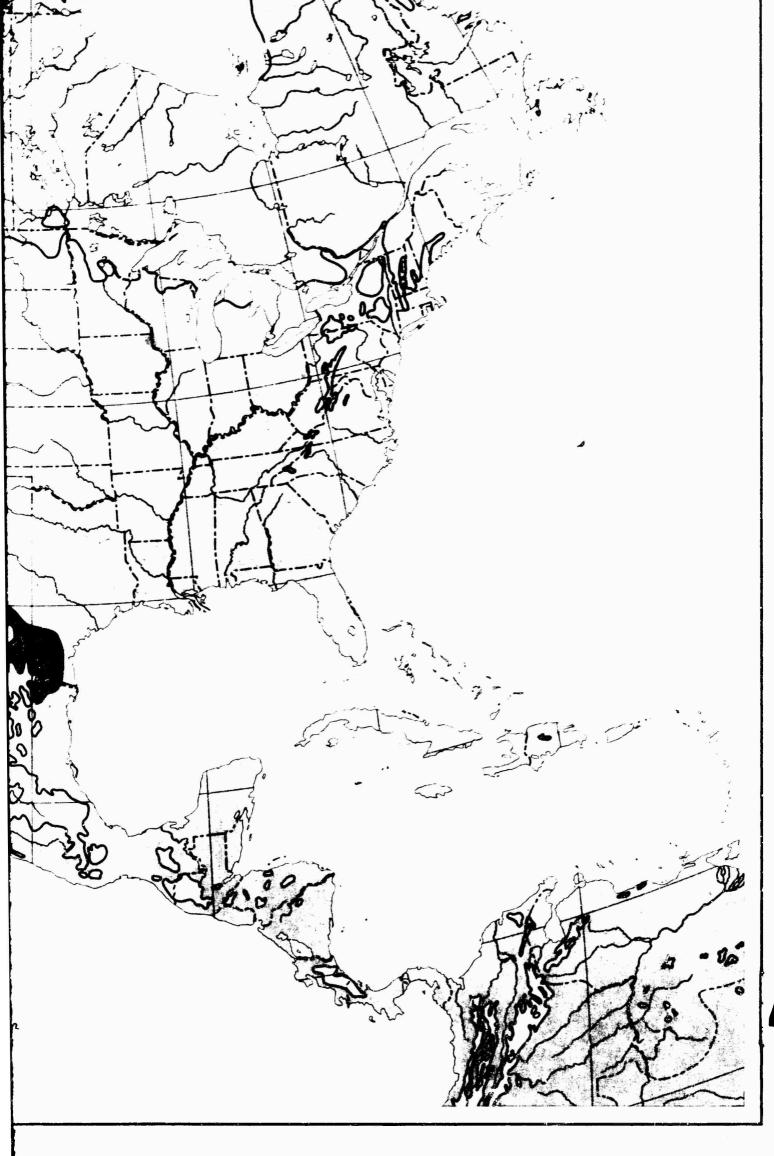


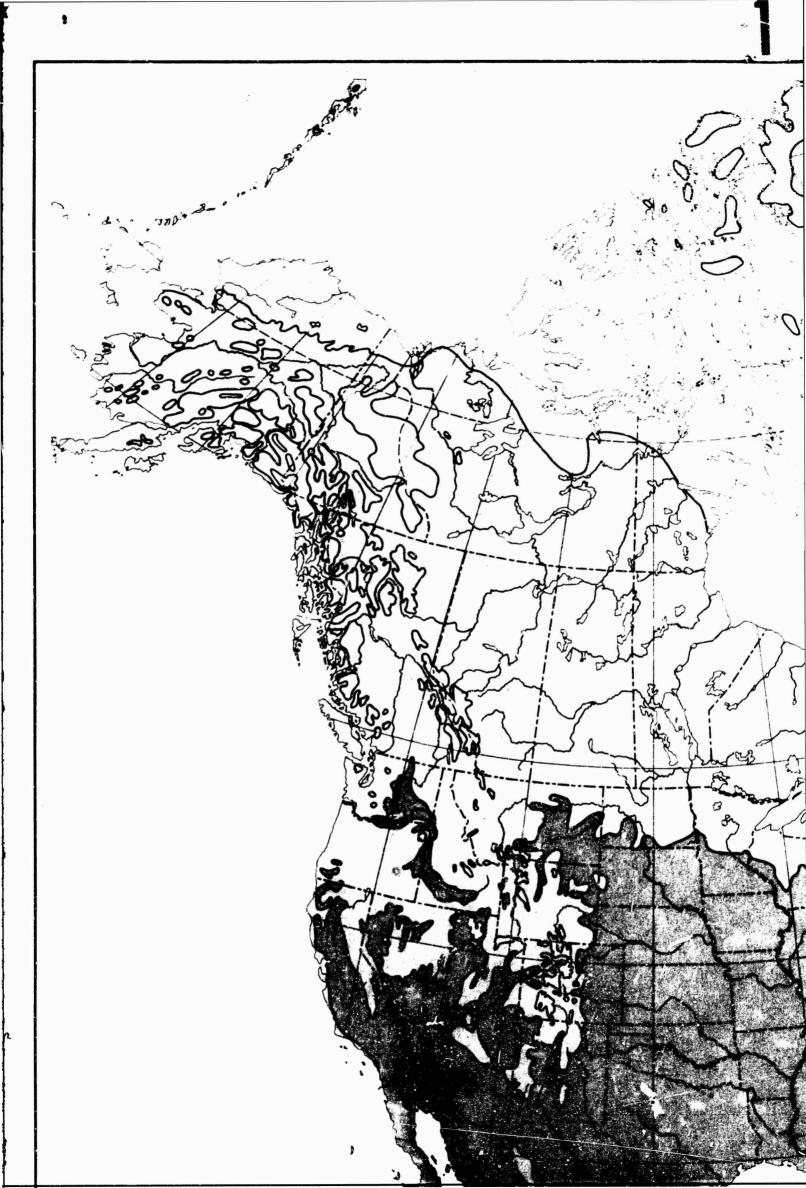


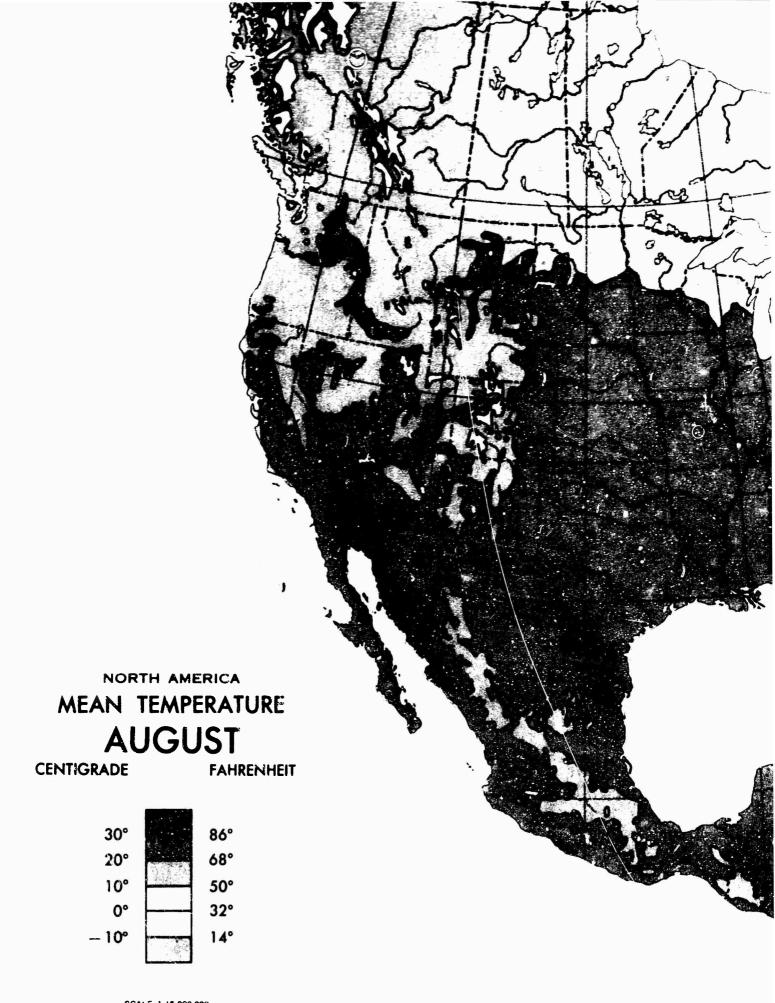


SCALE 1 18.000,000 5 50 100 200 300 400 500 MILES

BONNE PROJECTION

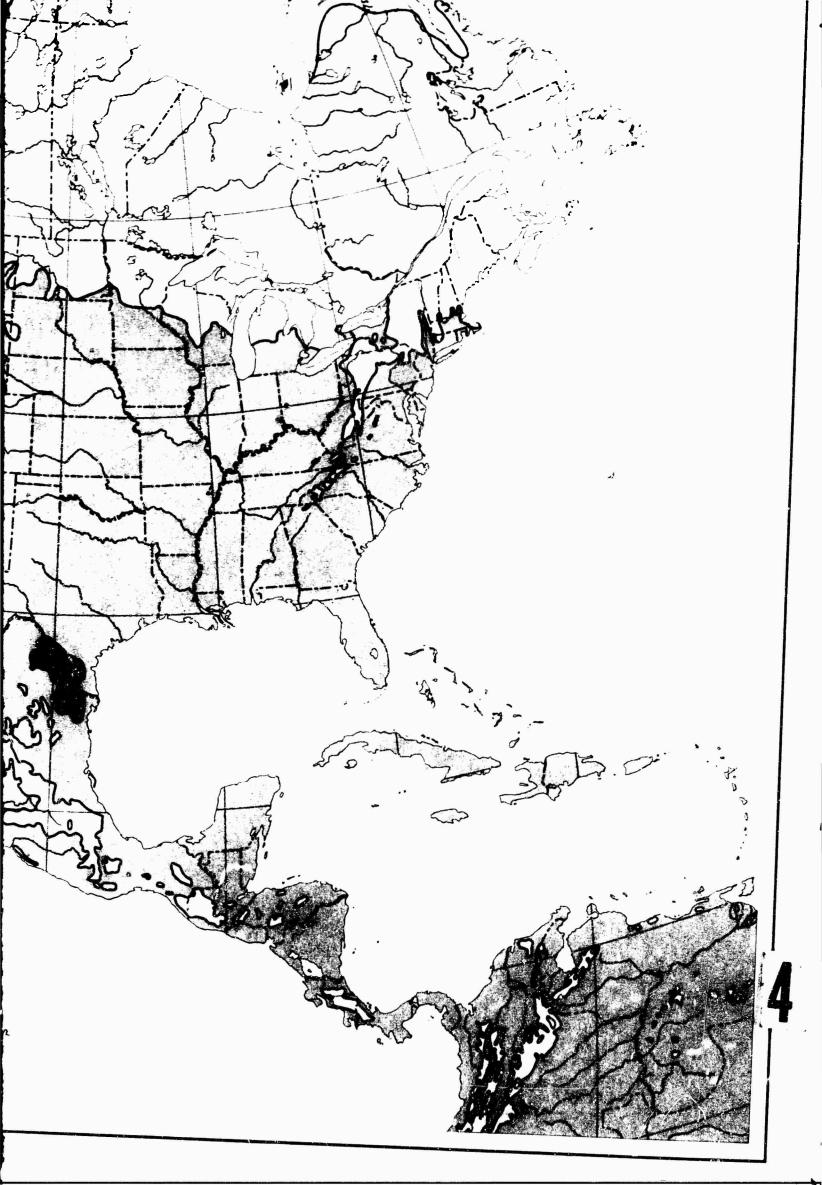


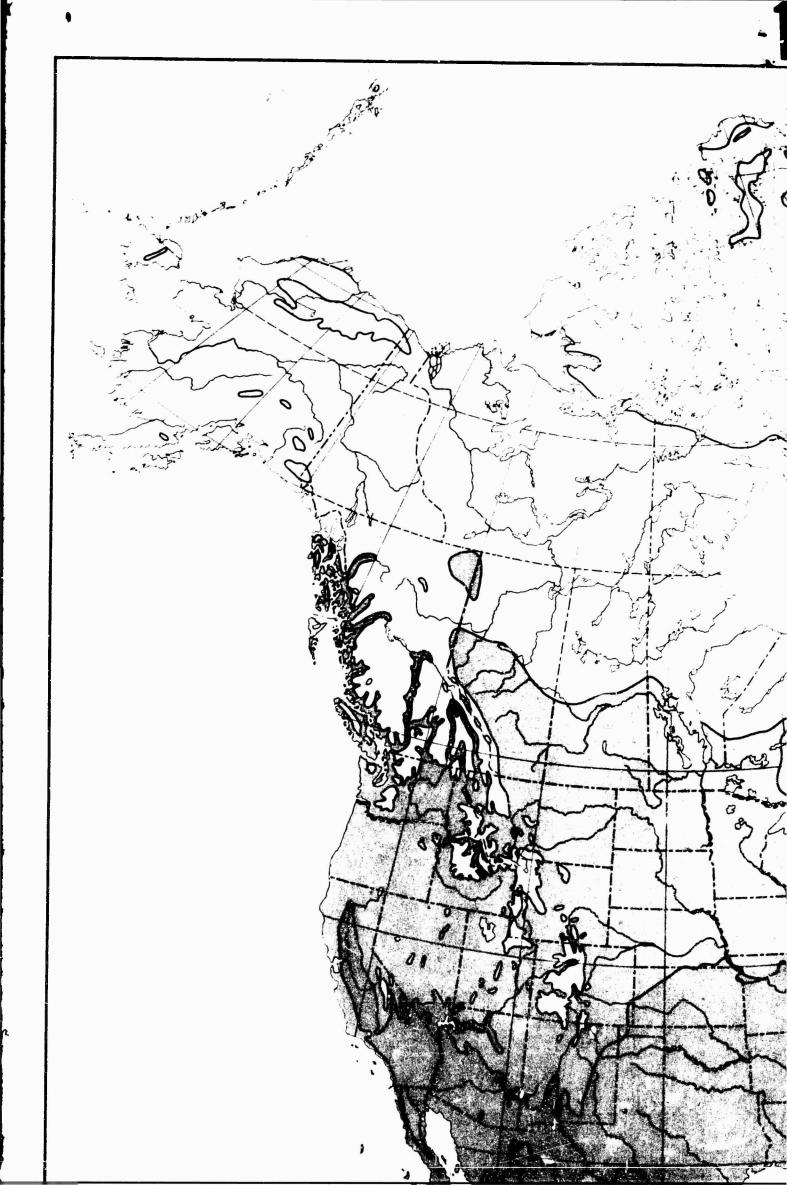


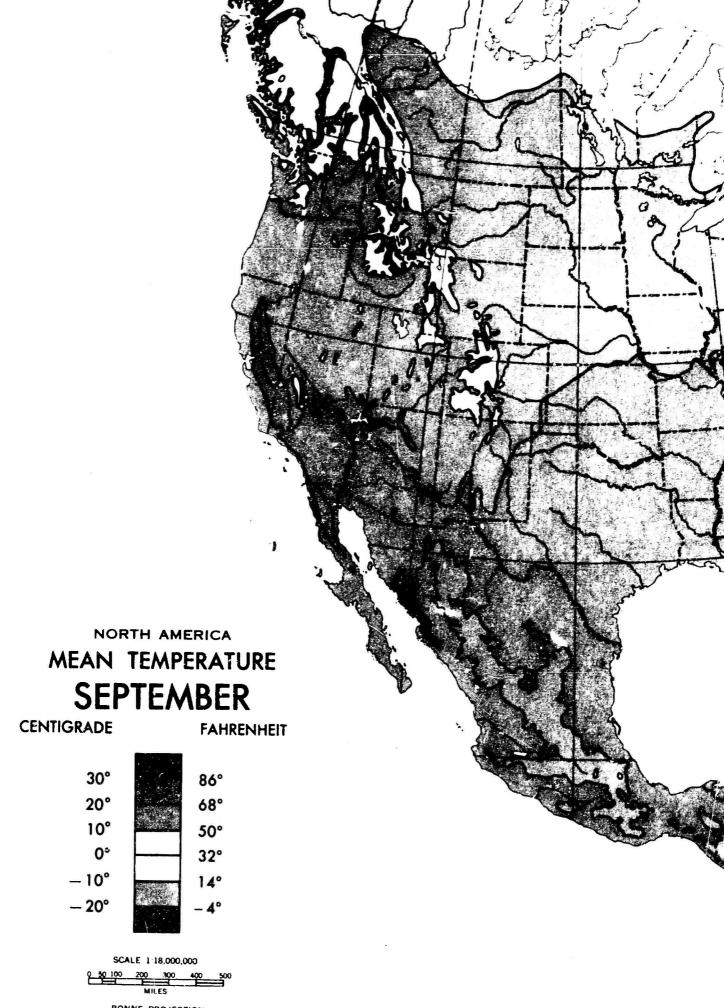


SCALE 1:15,000,000 0 50 100 200 300 400 500 Miles

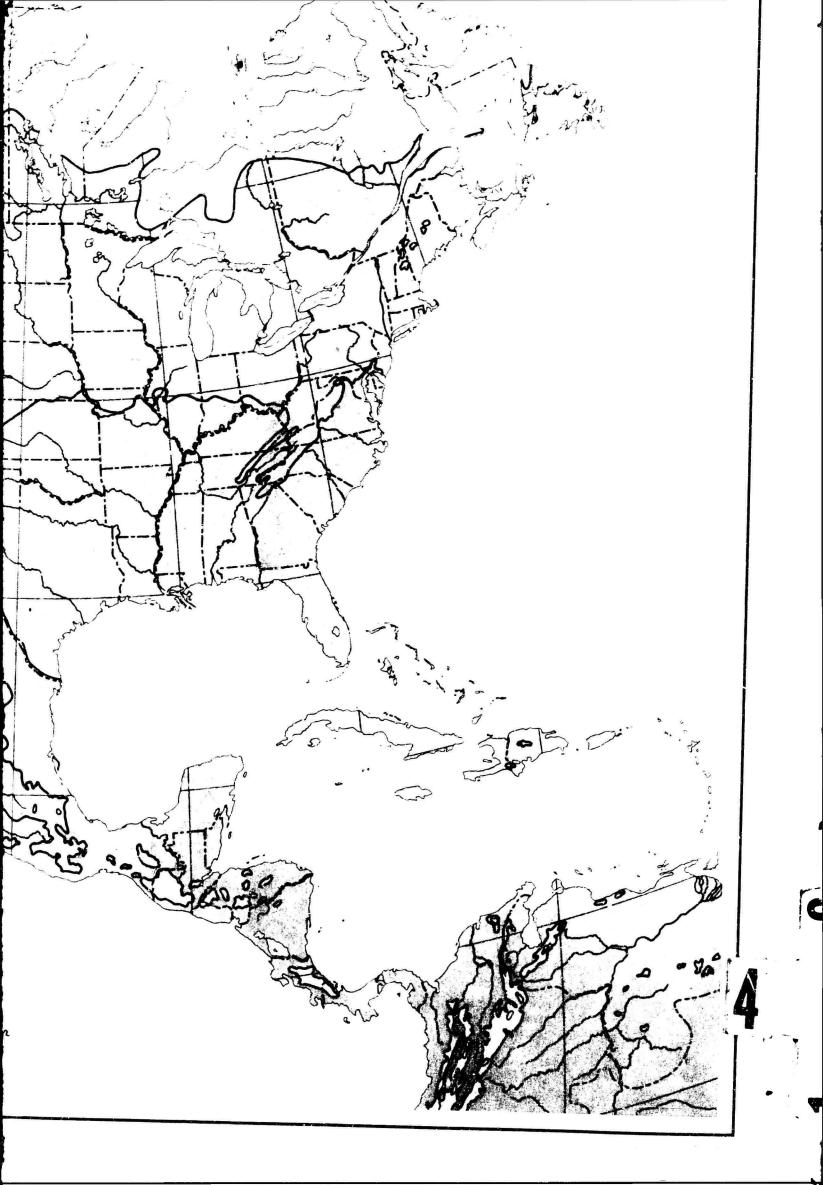
BONNE PROJECTION

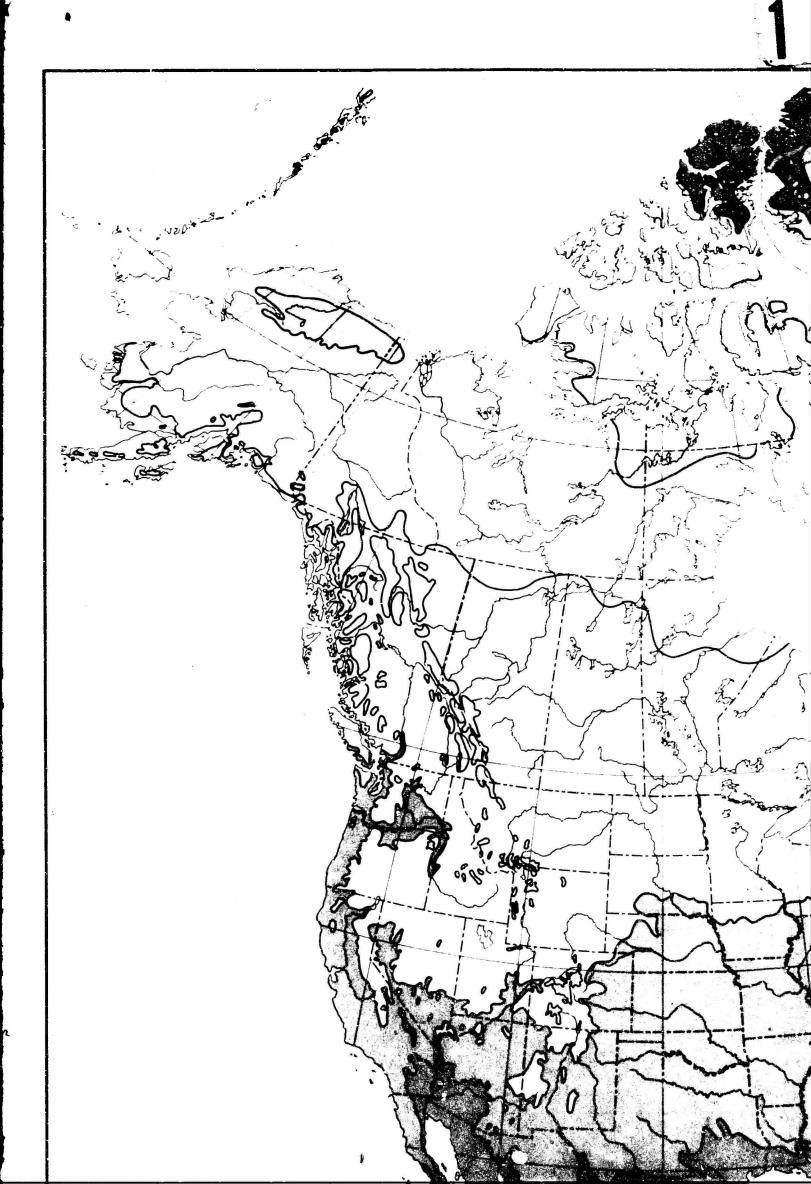


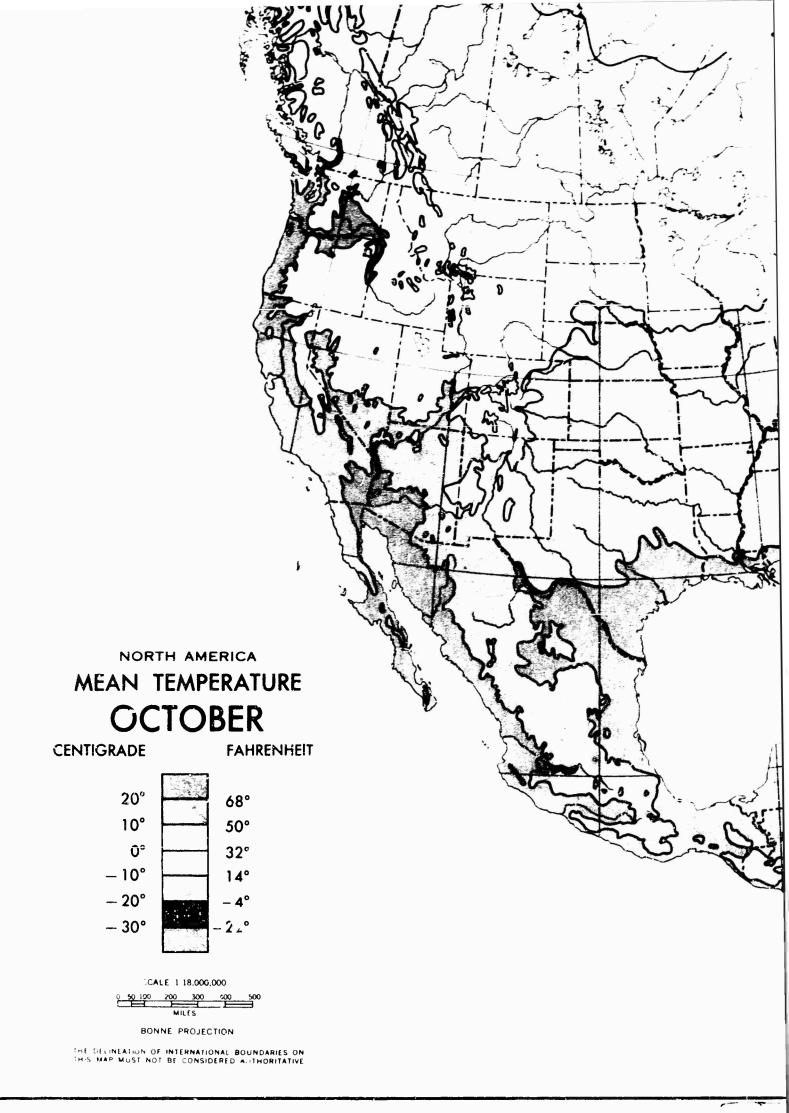


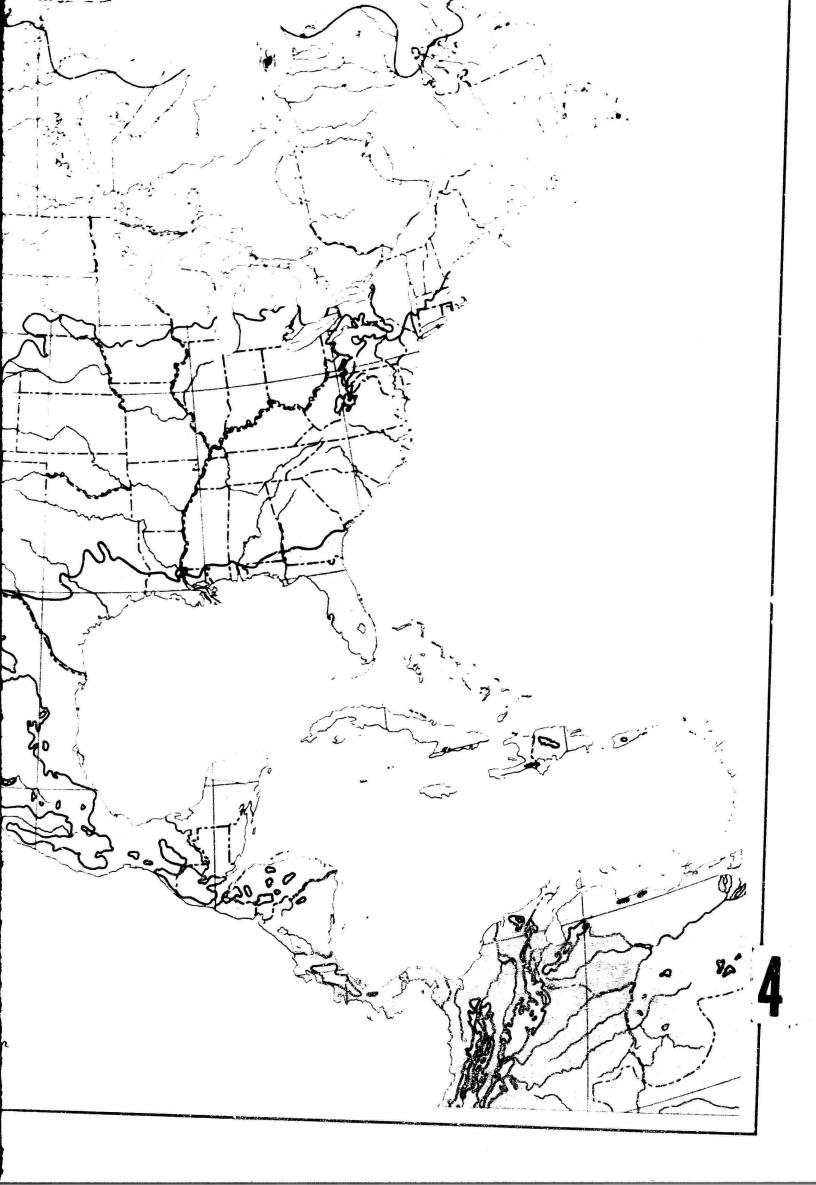


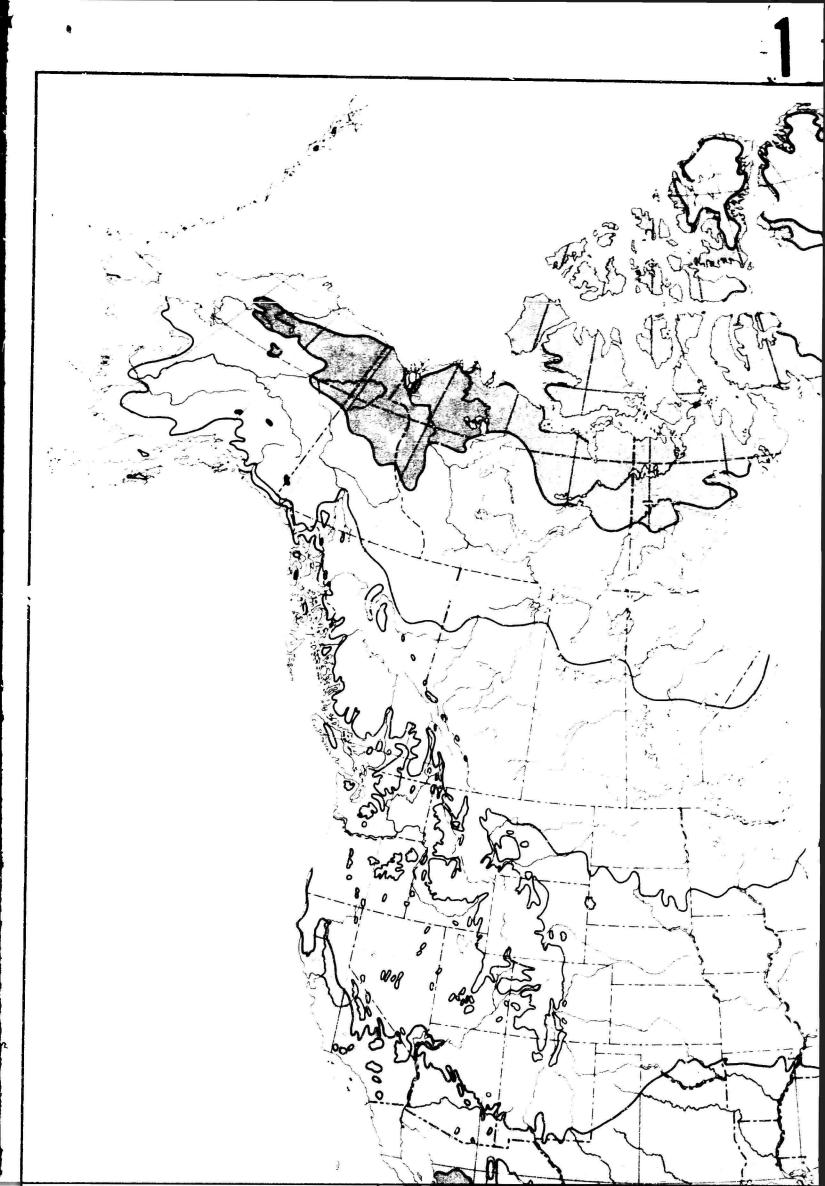
BONNE PROJECTION

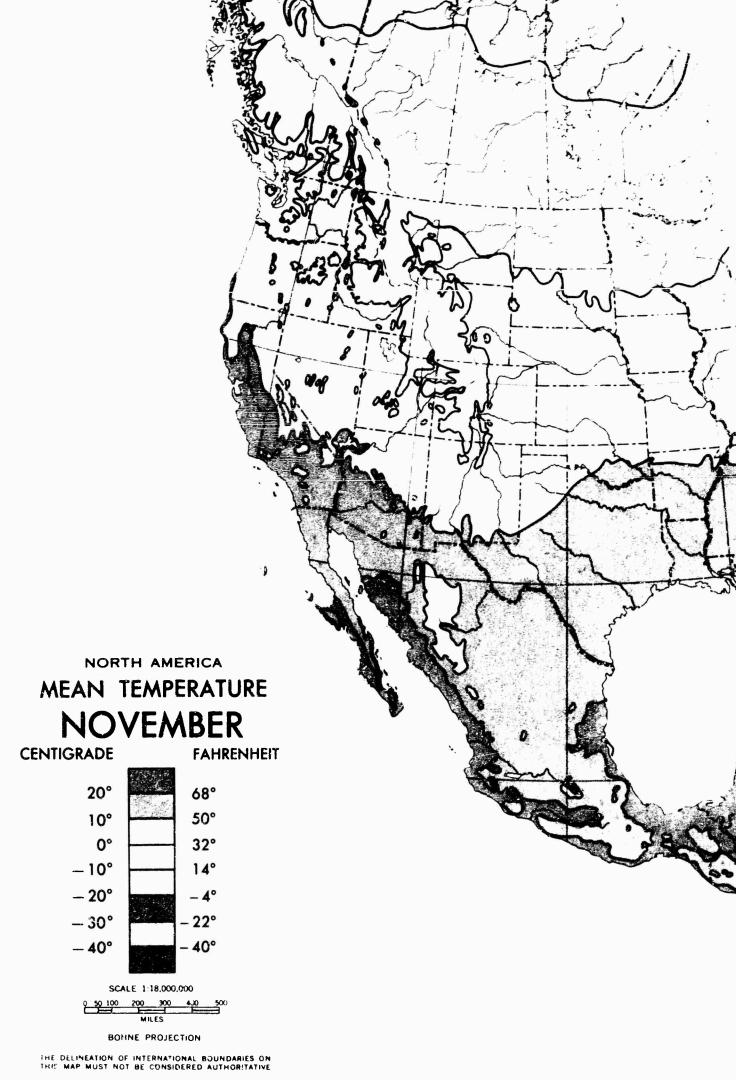


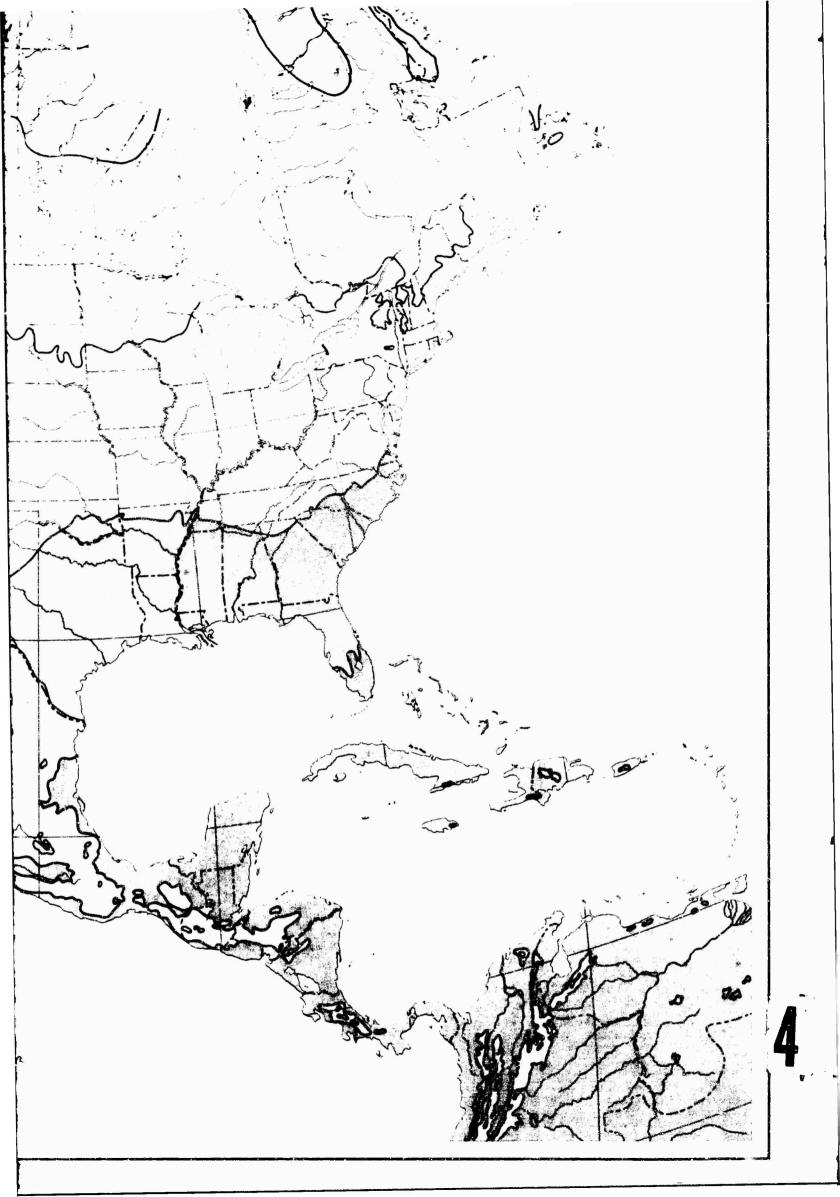


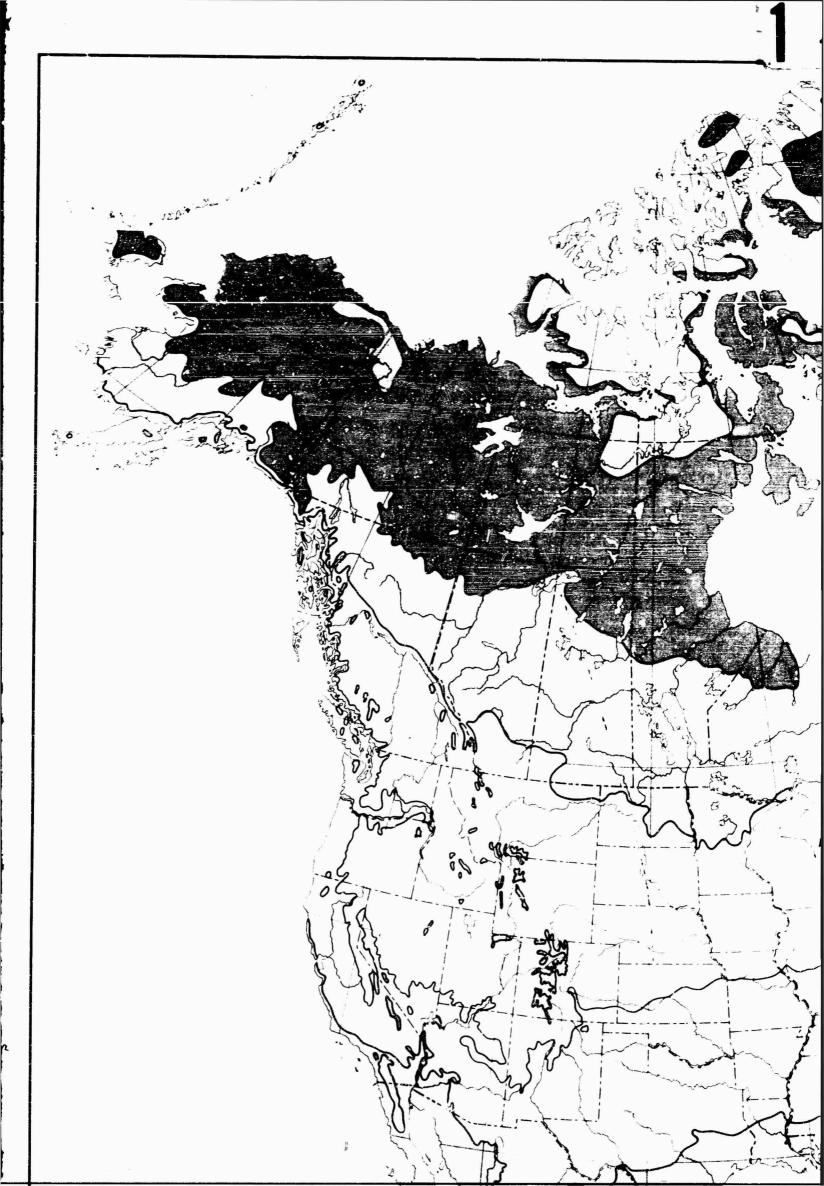


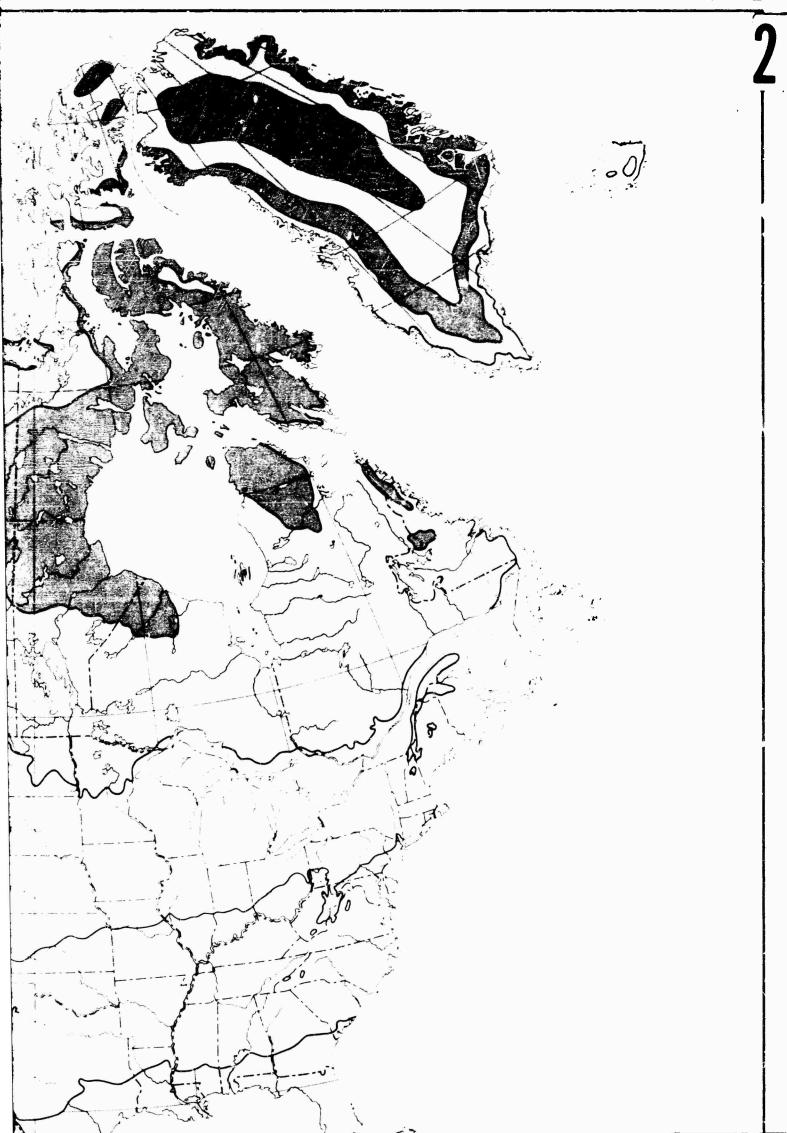


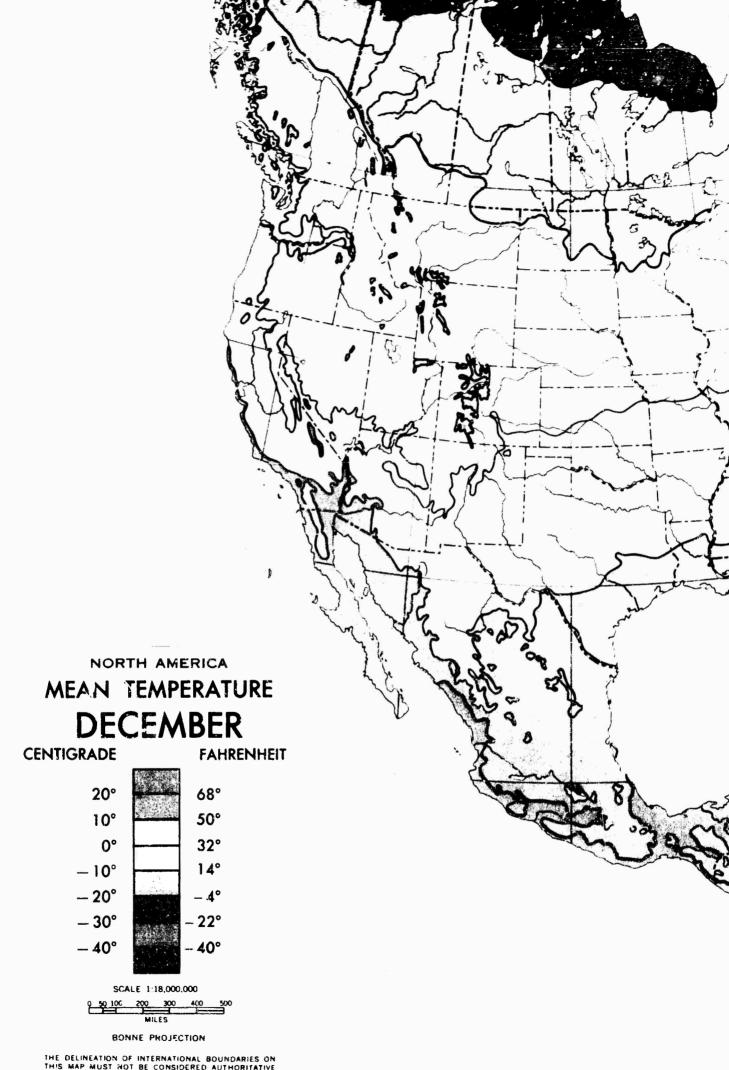


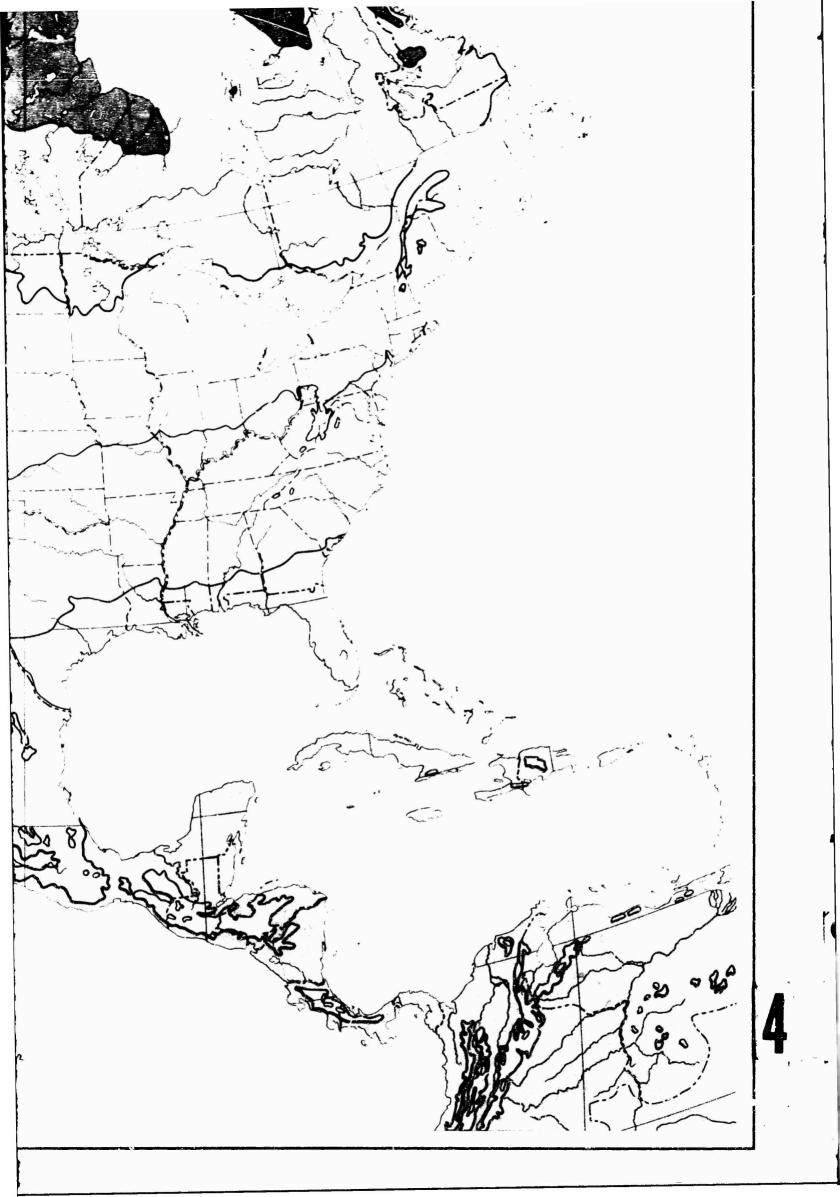


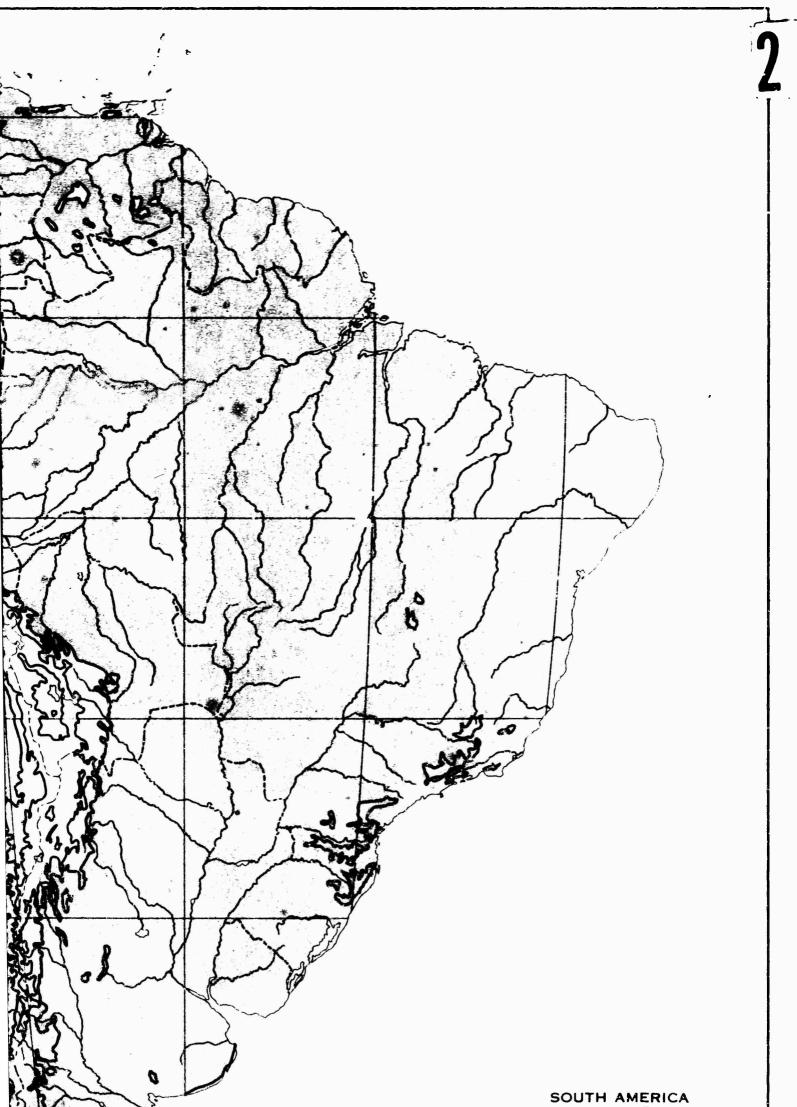


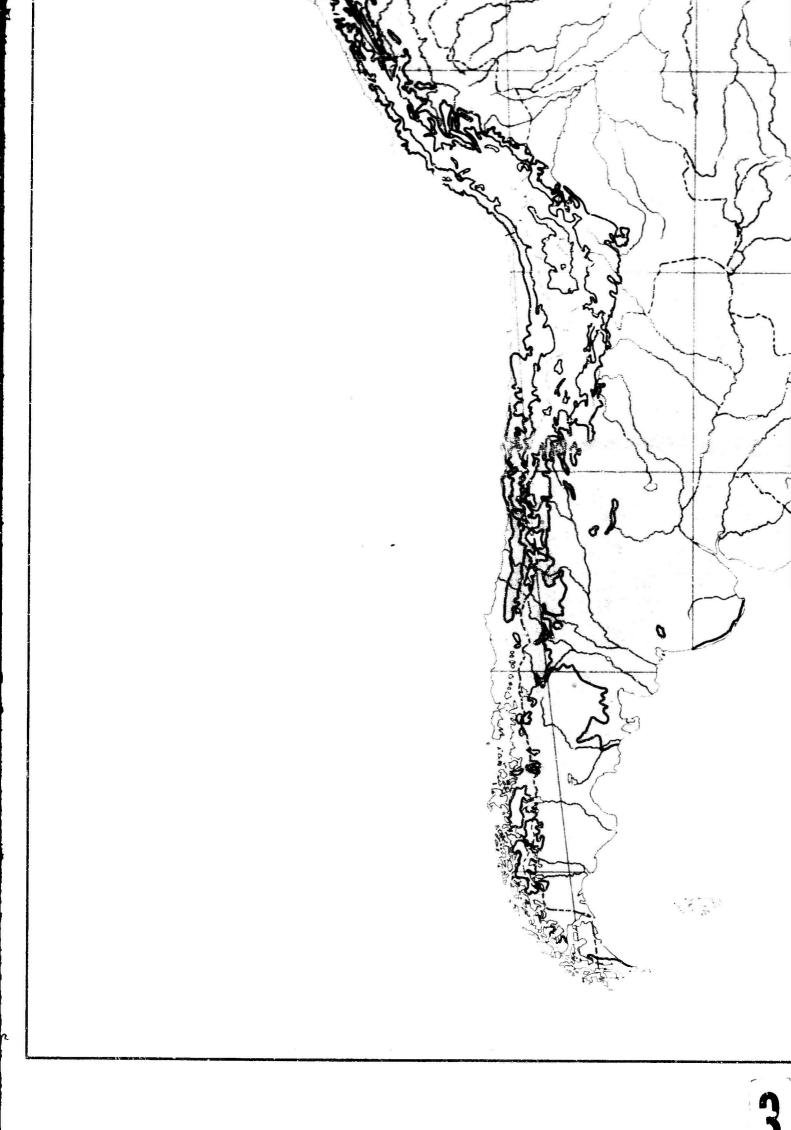


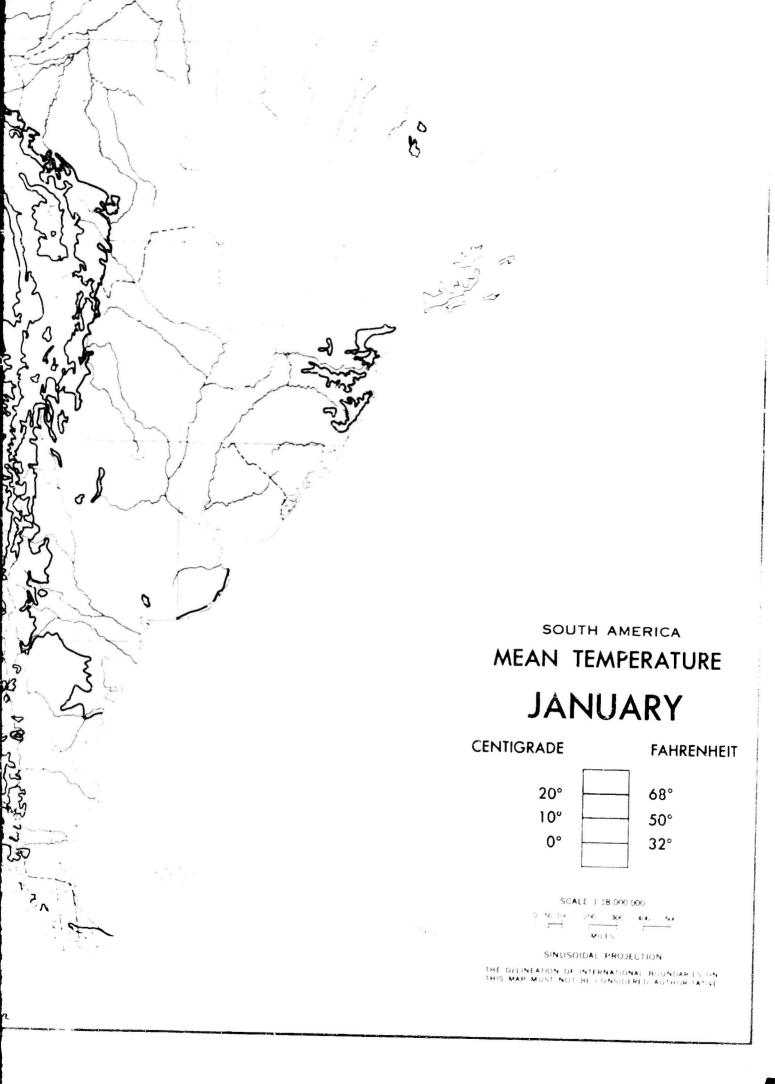


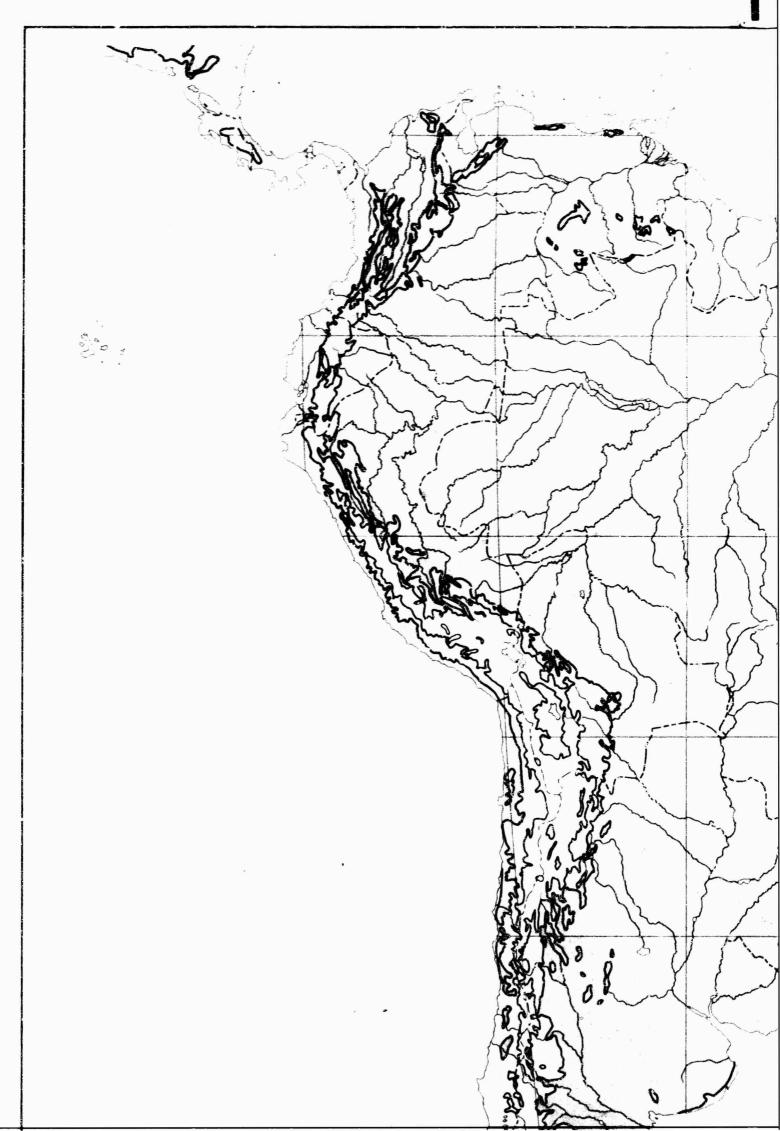




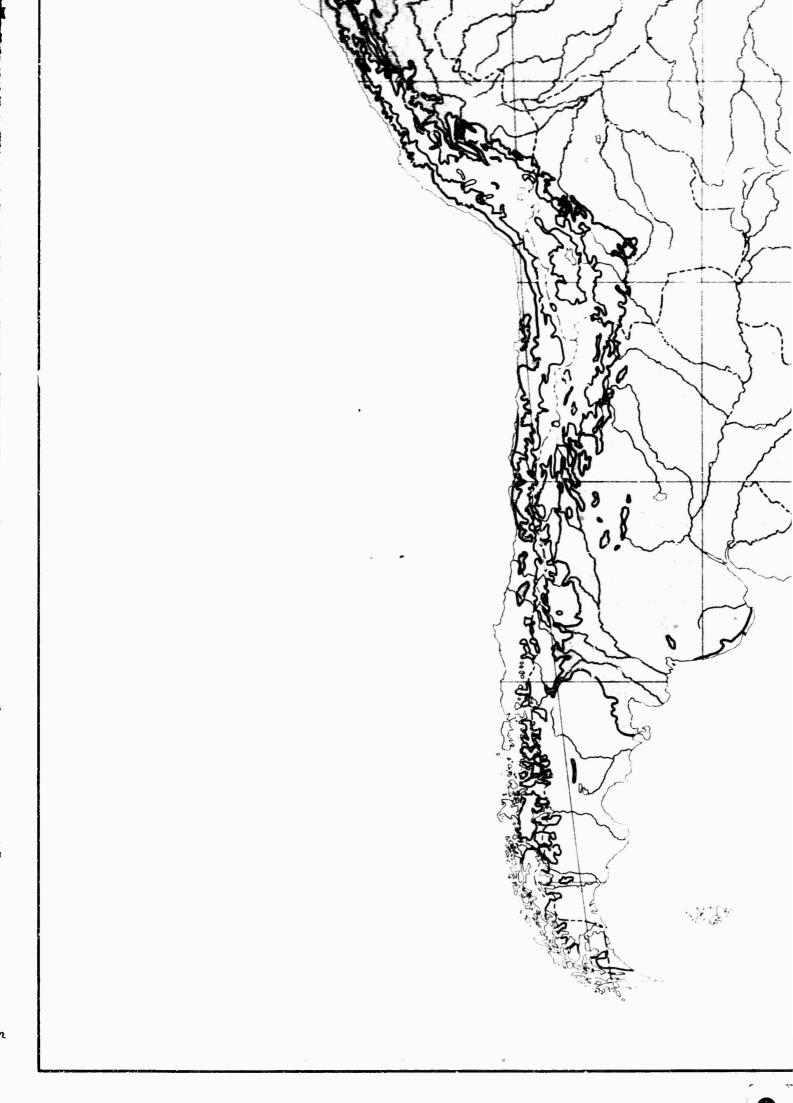


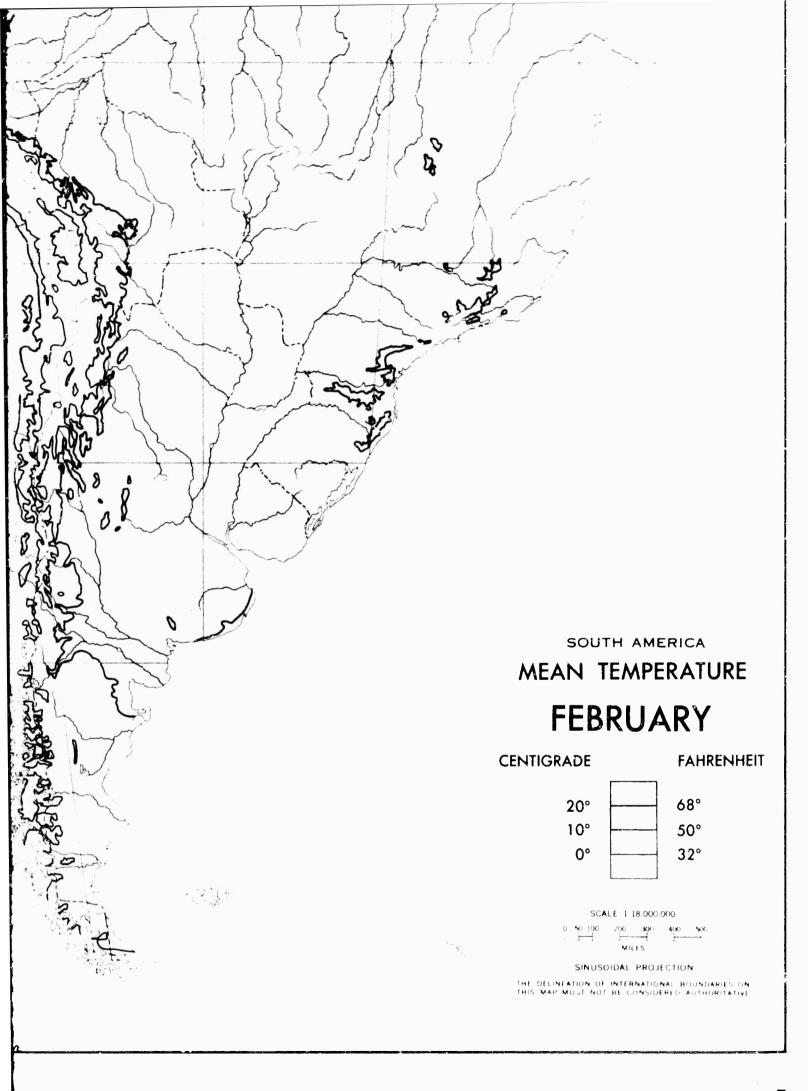


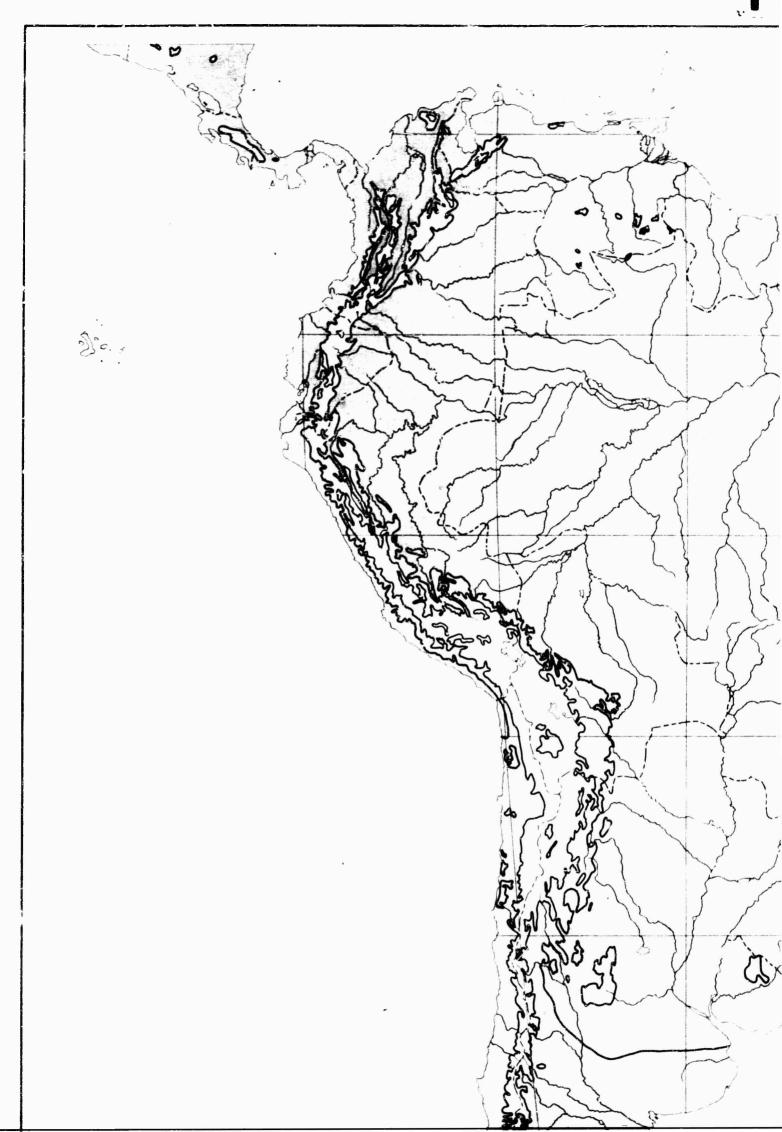


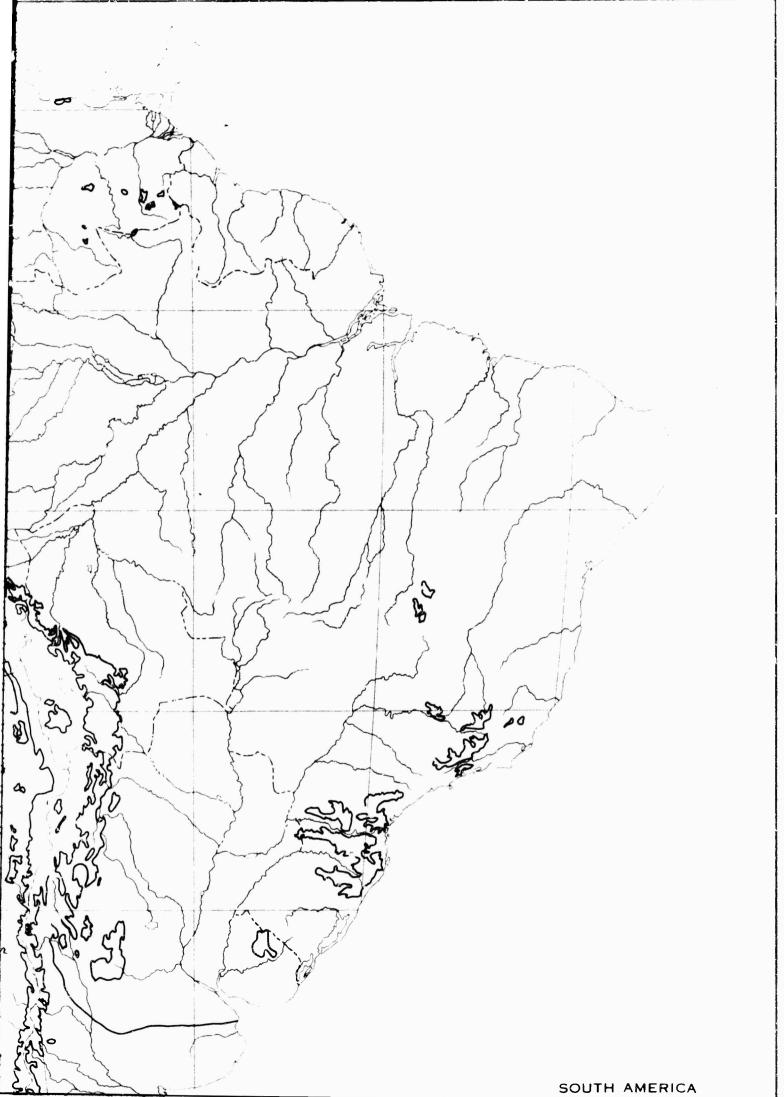


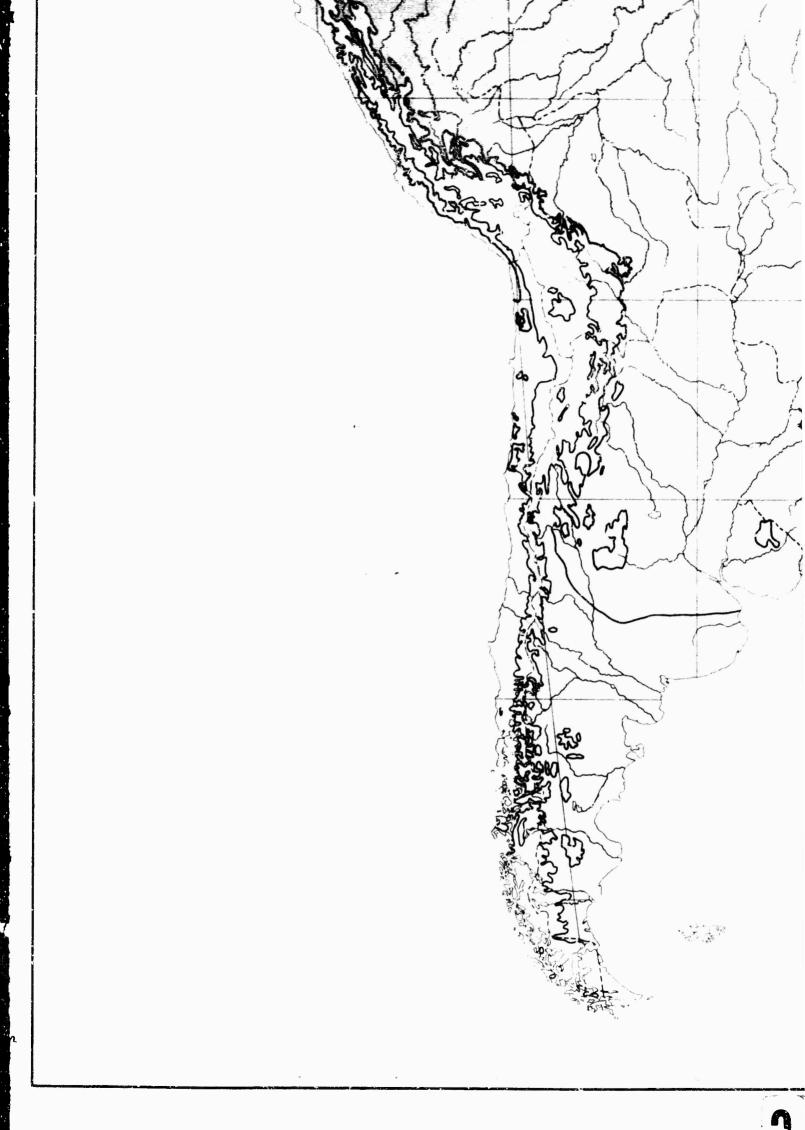
SOUTH AMERICA

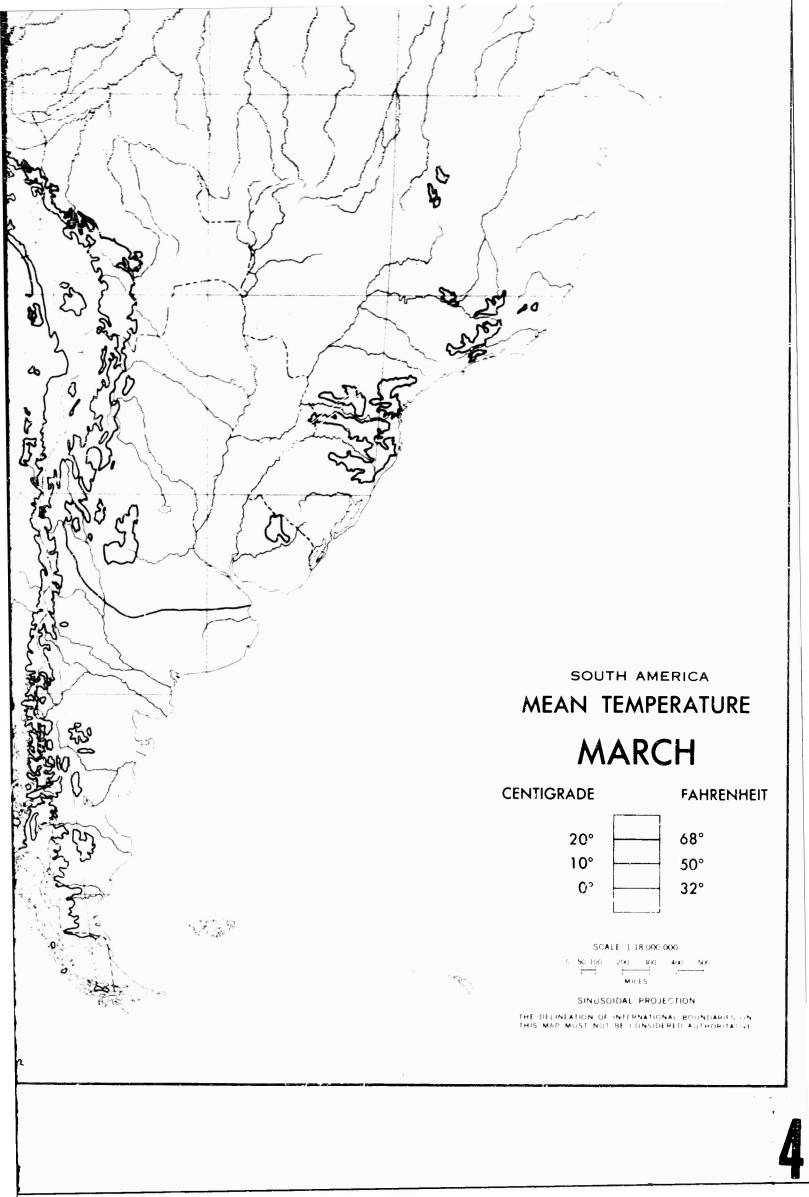


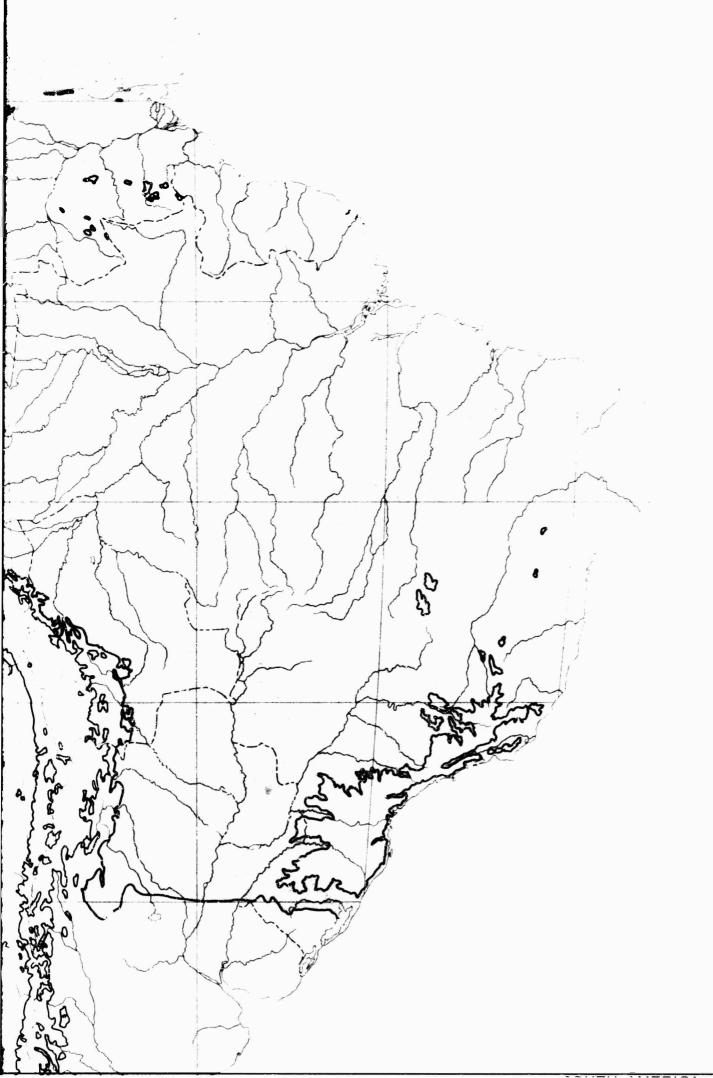


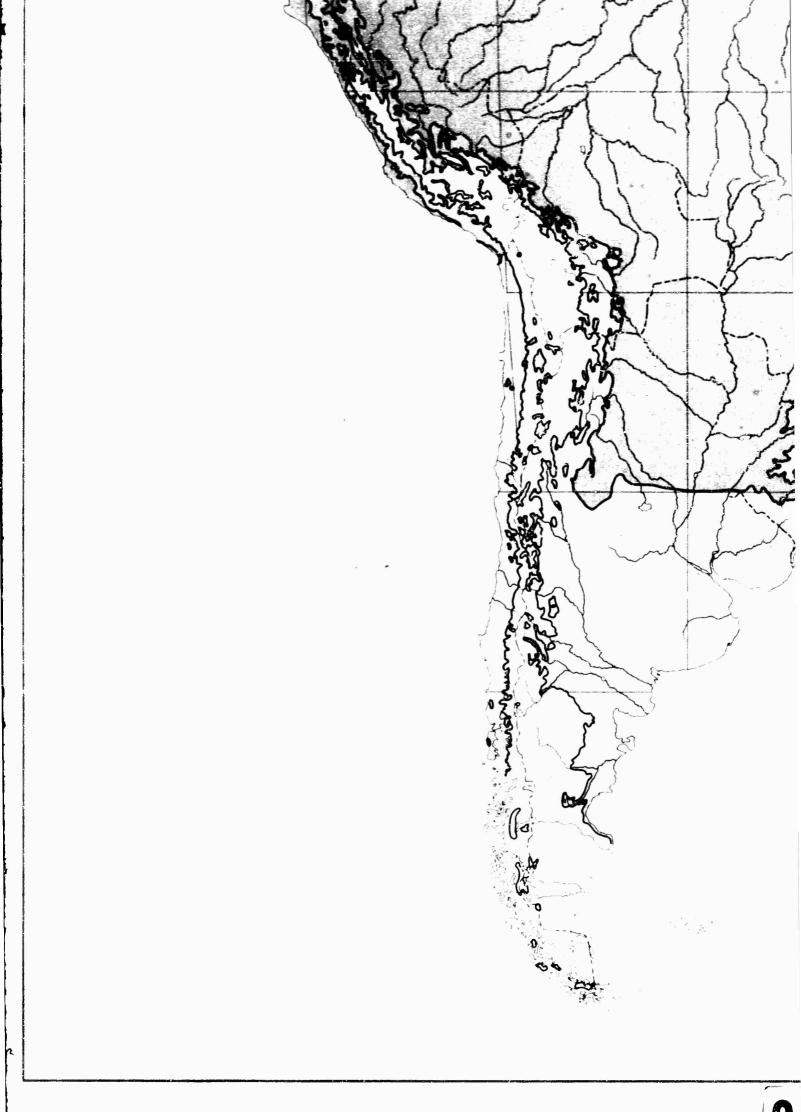


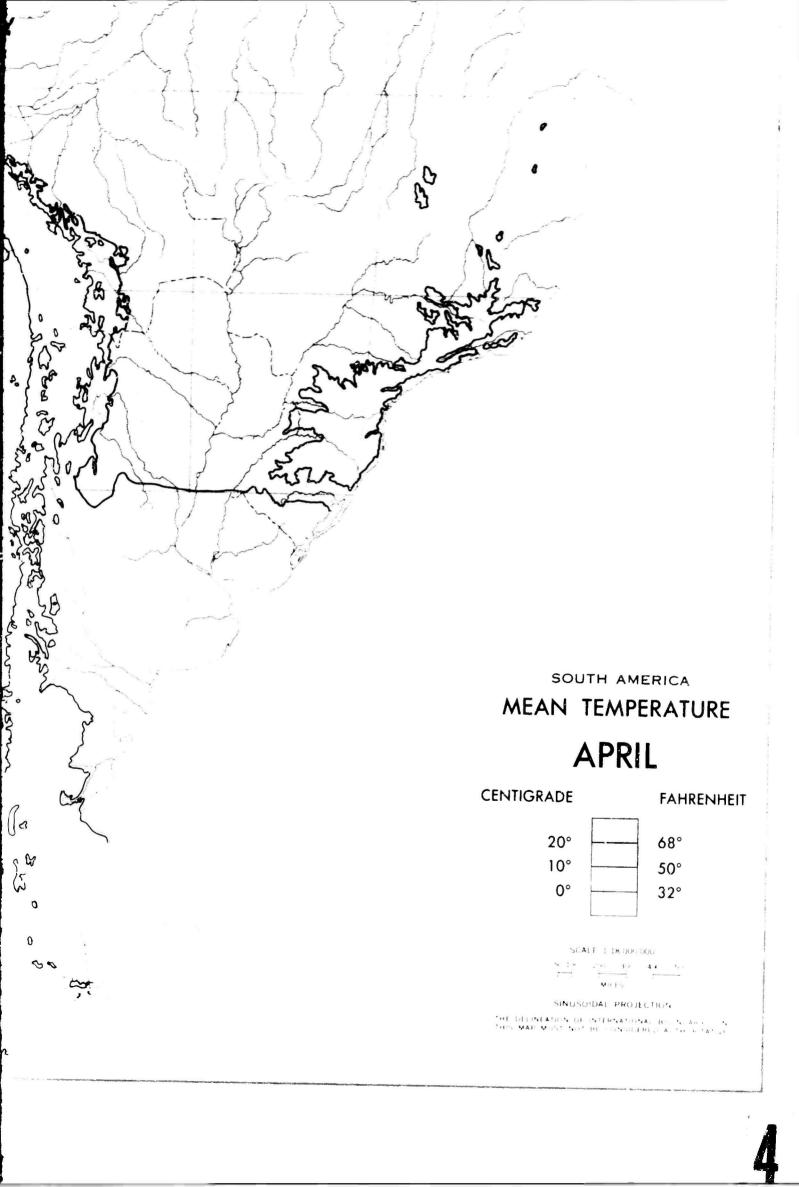


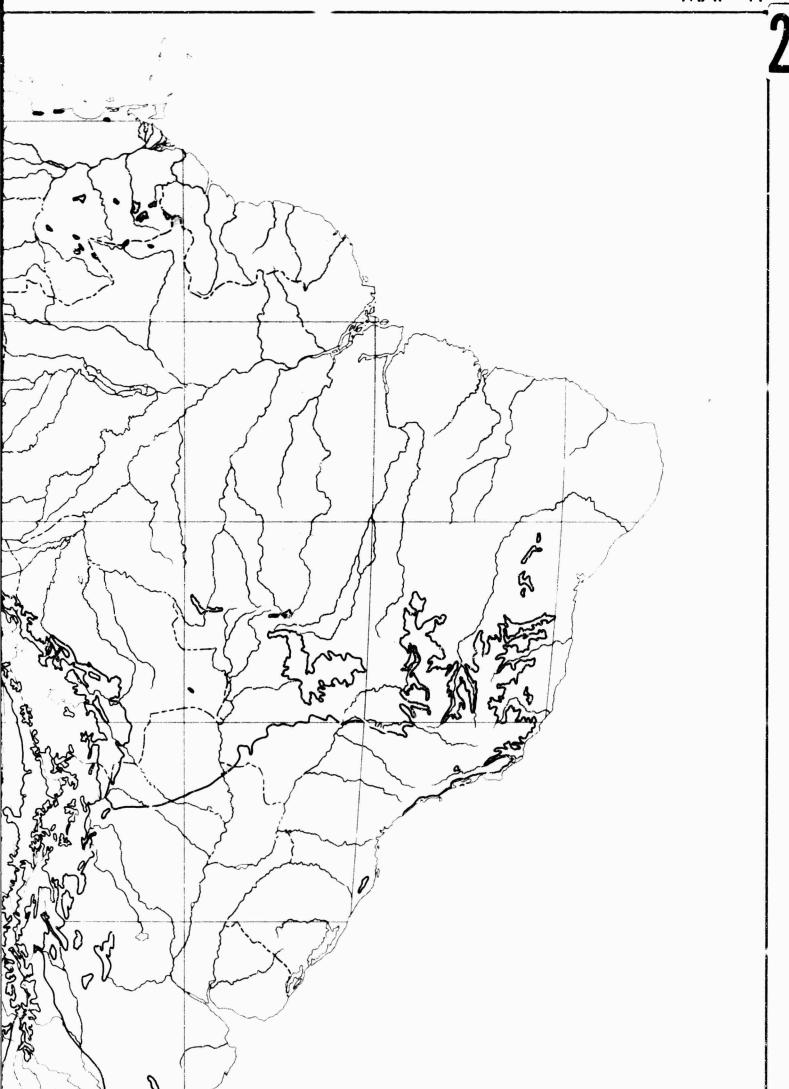


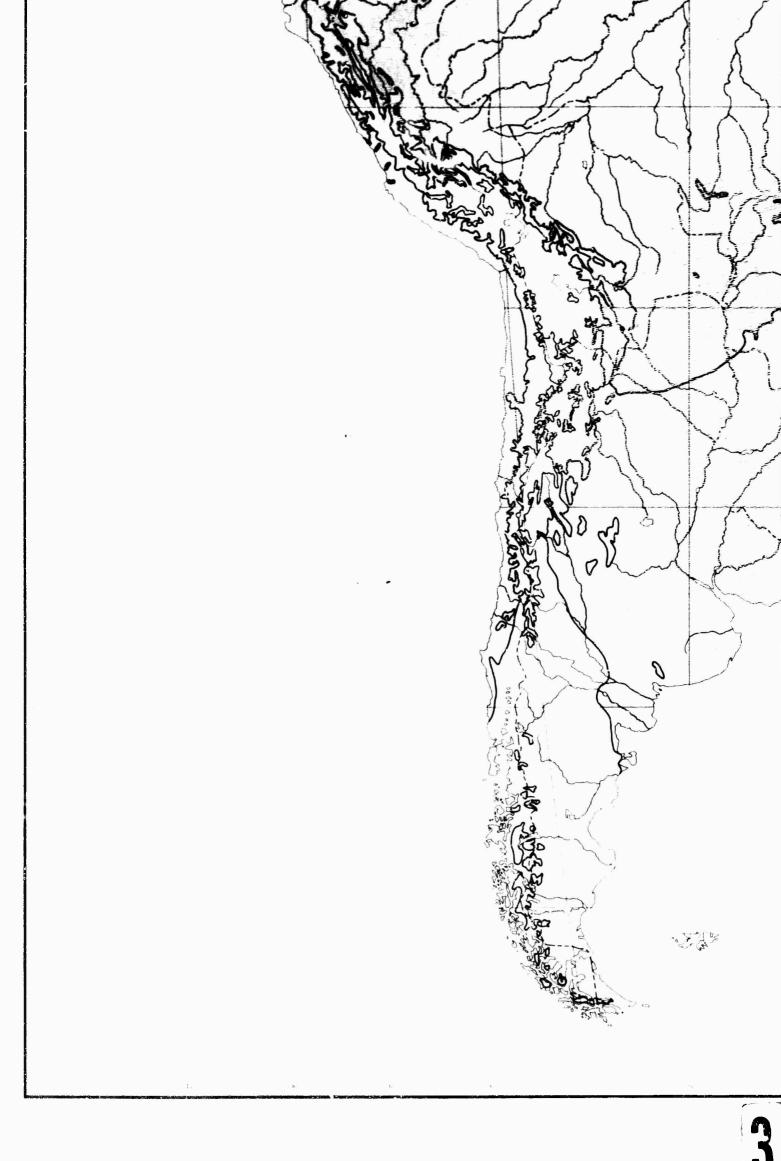


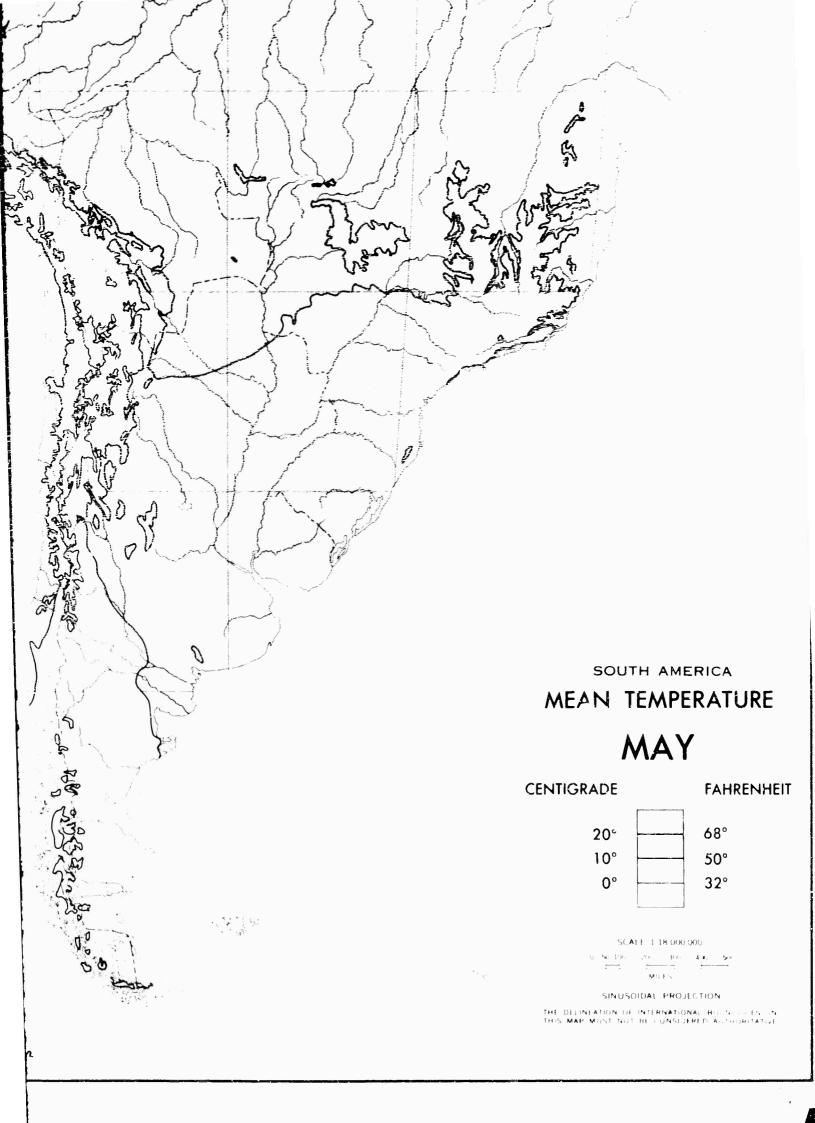


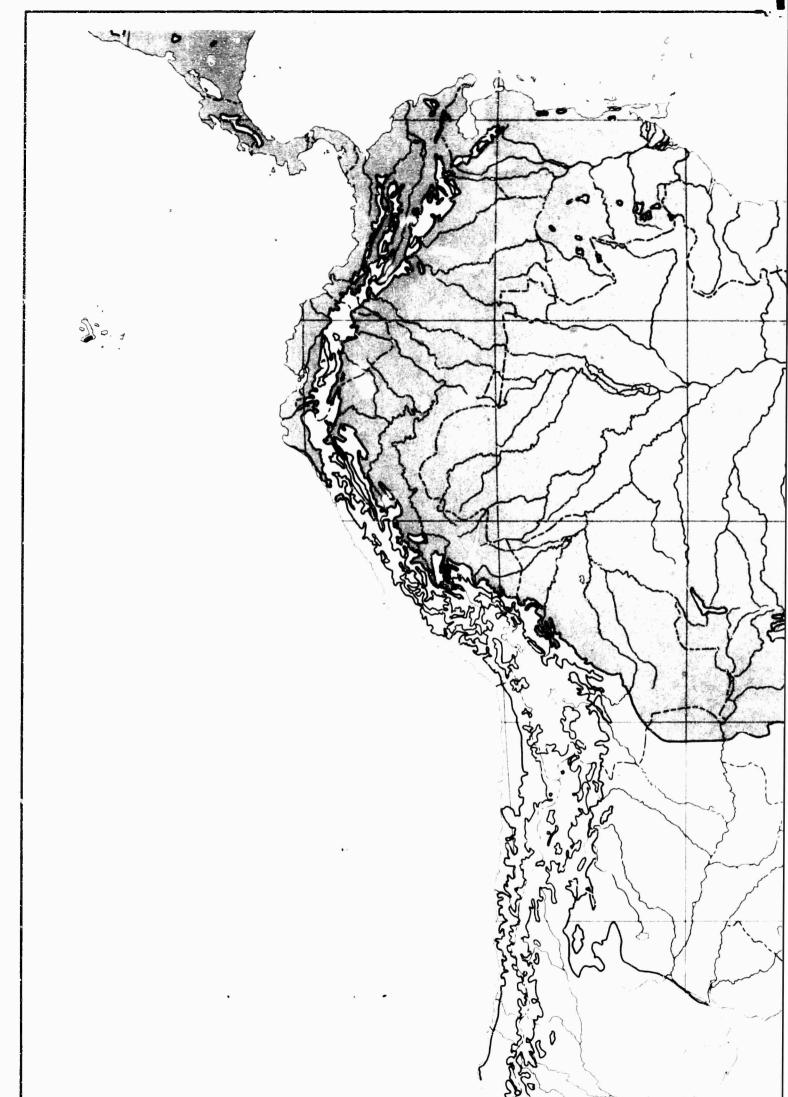


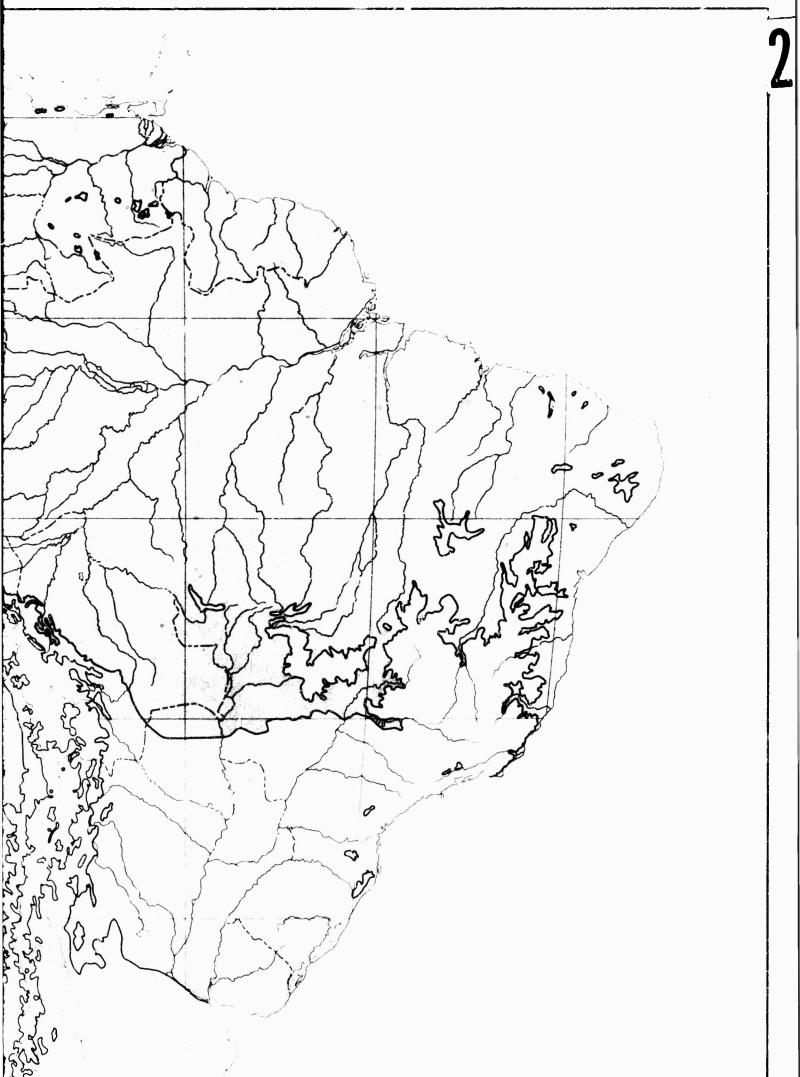


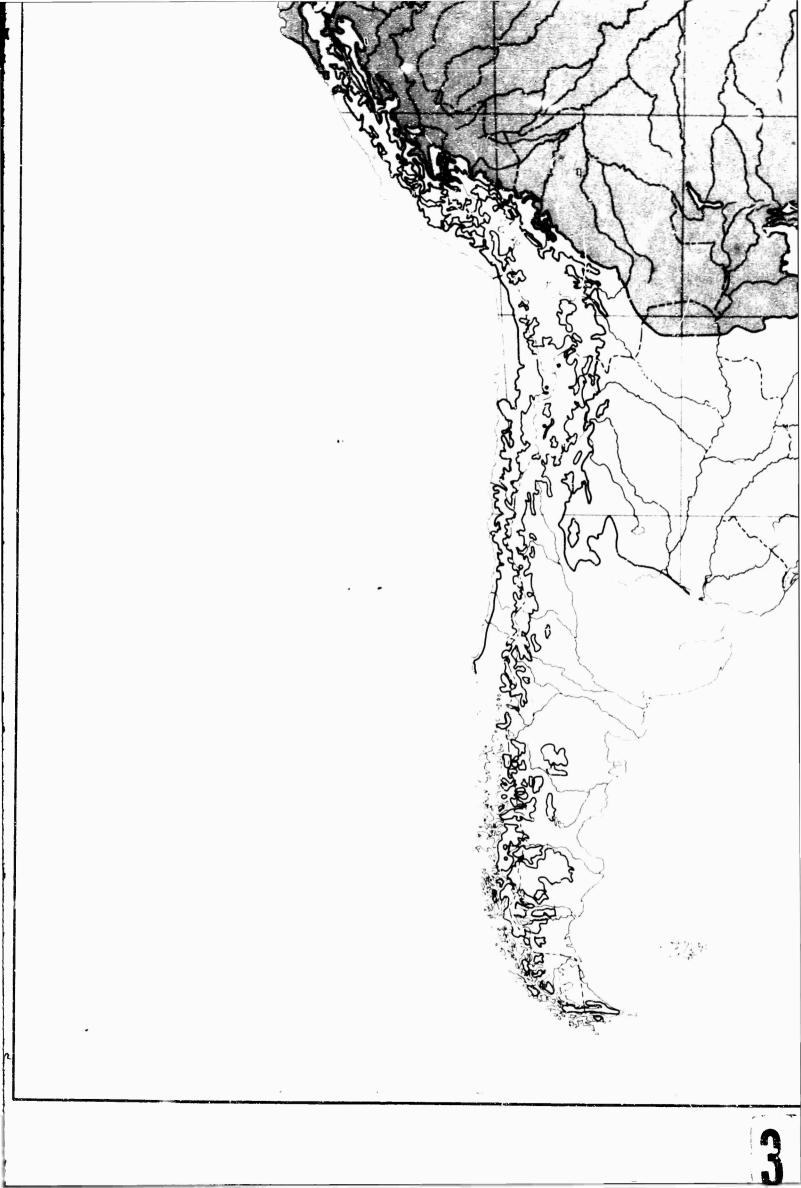


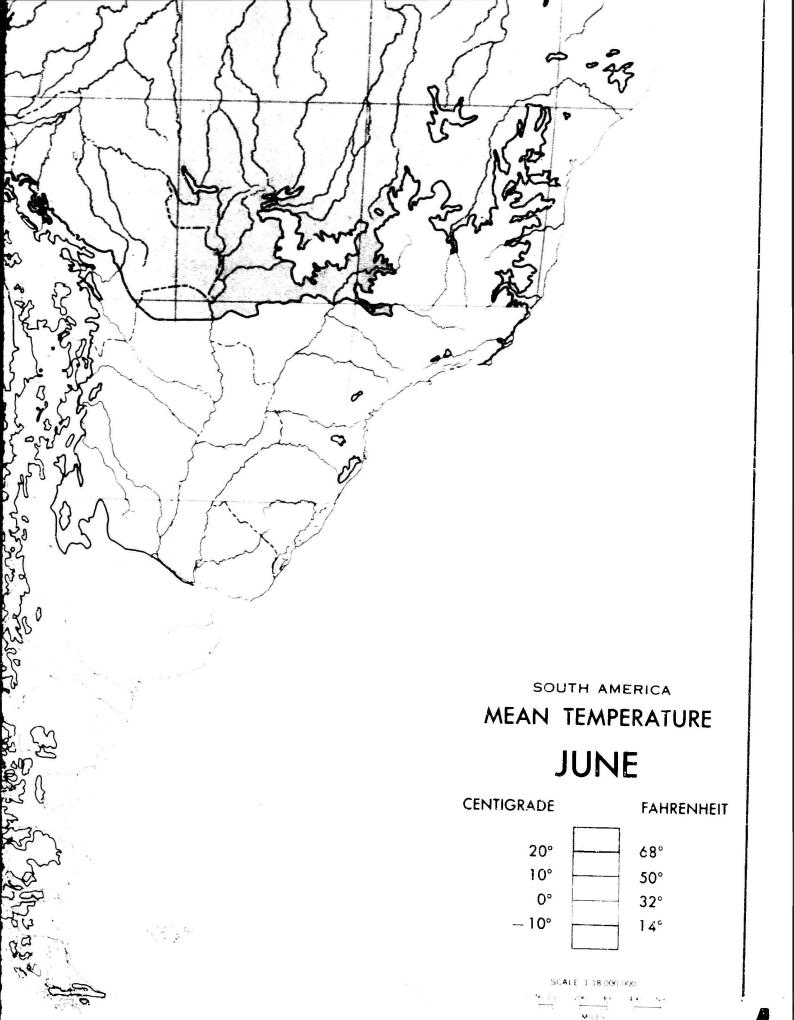






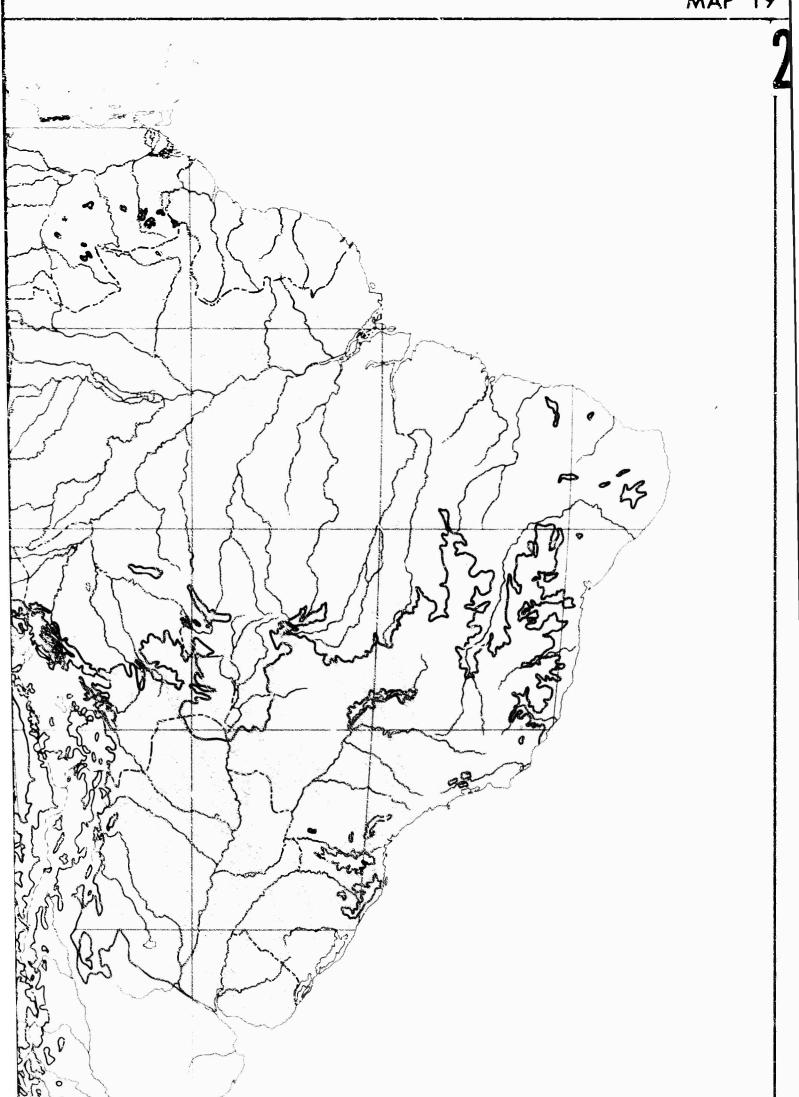


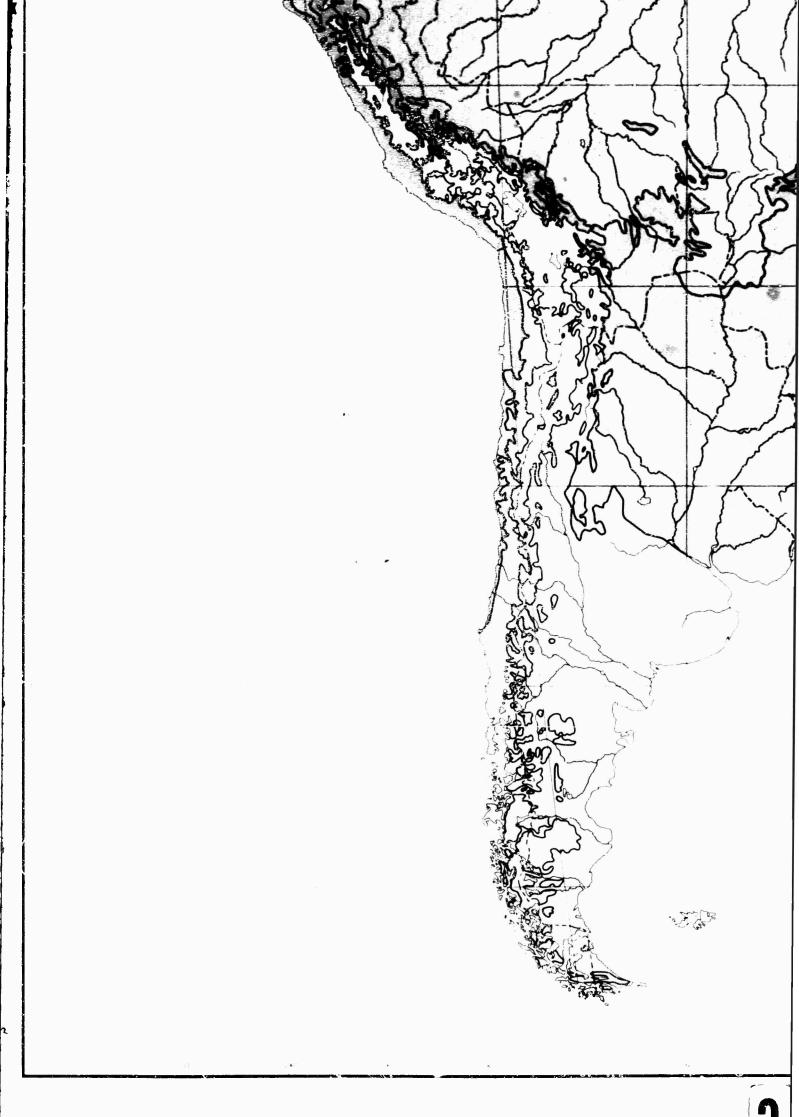


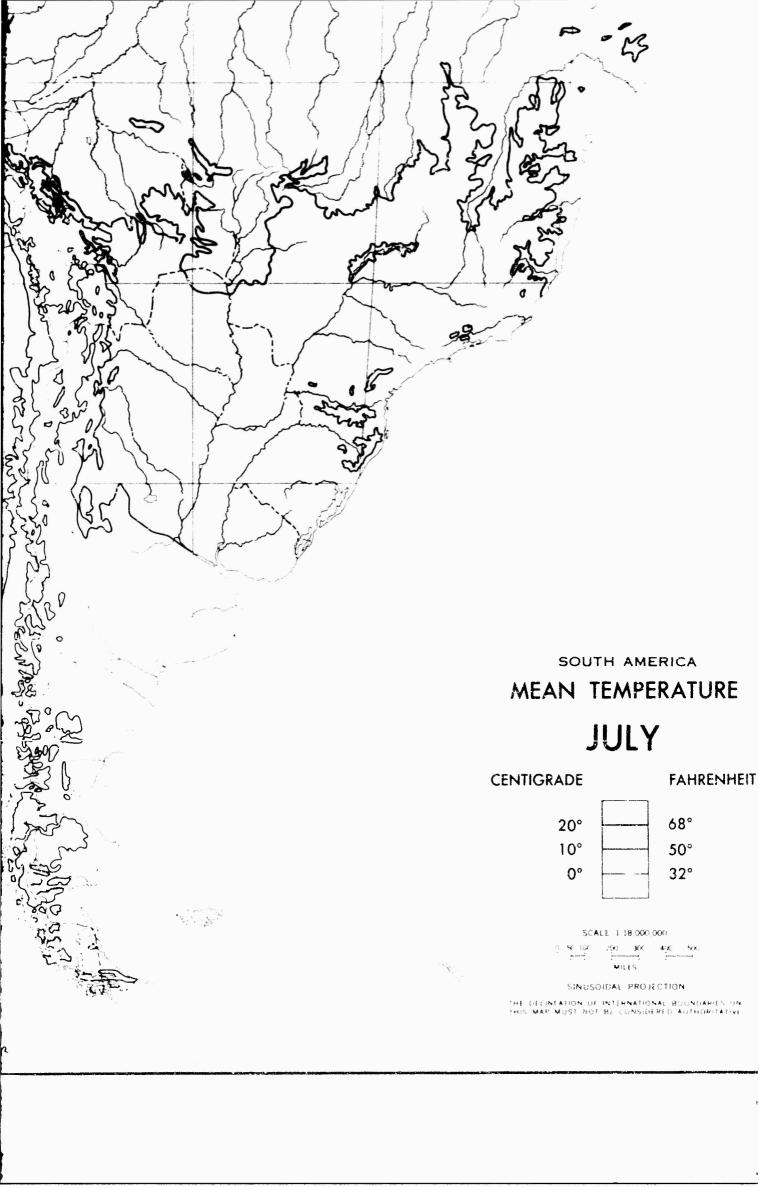


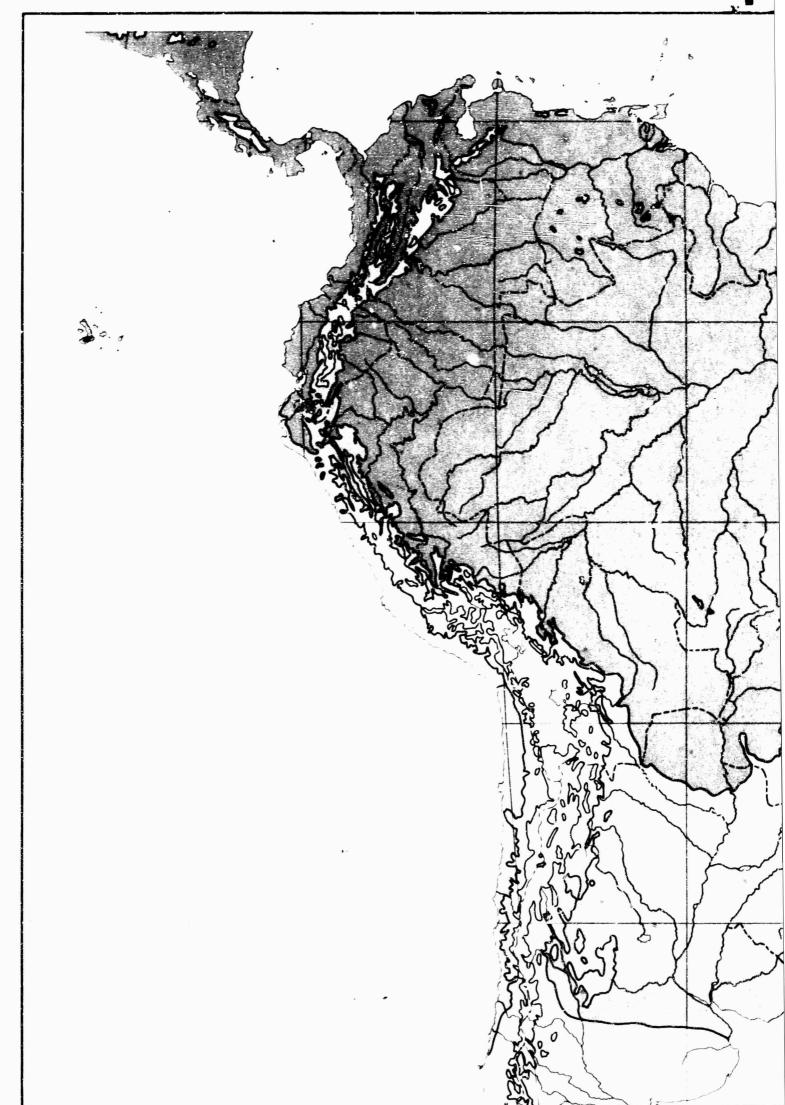
4

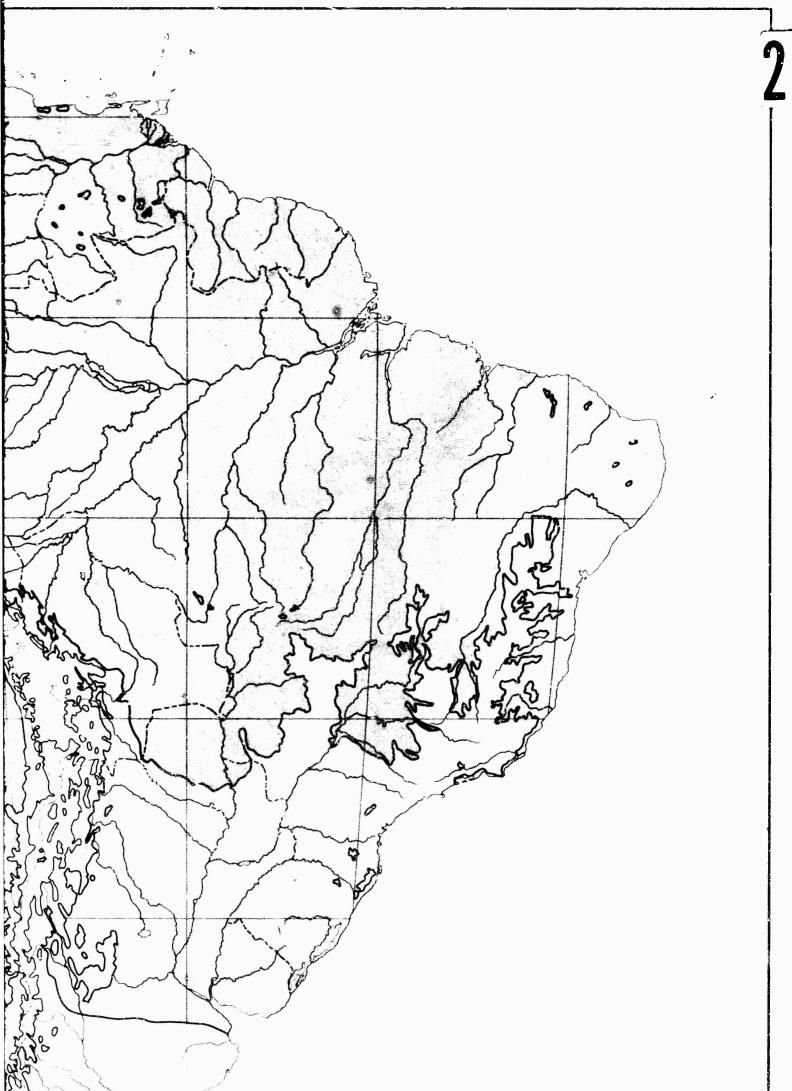
SINUSCIDAL PROJECTION

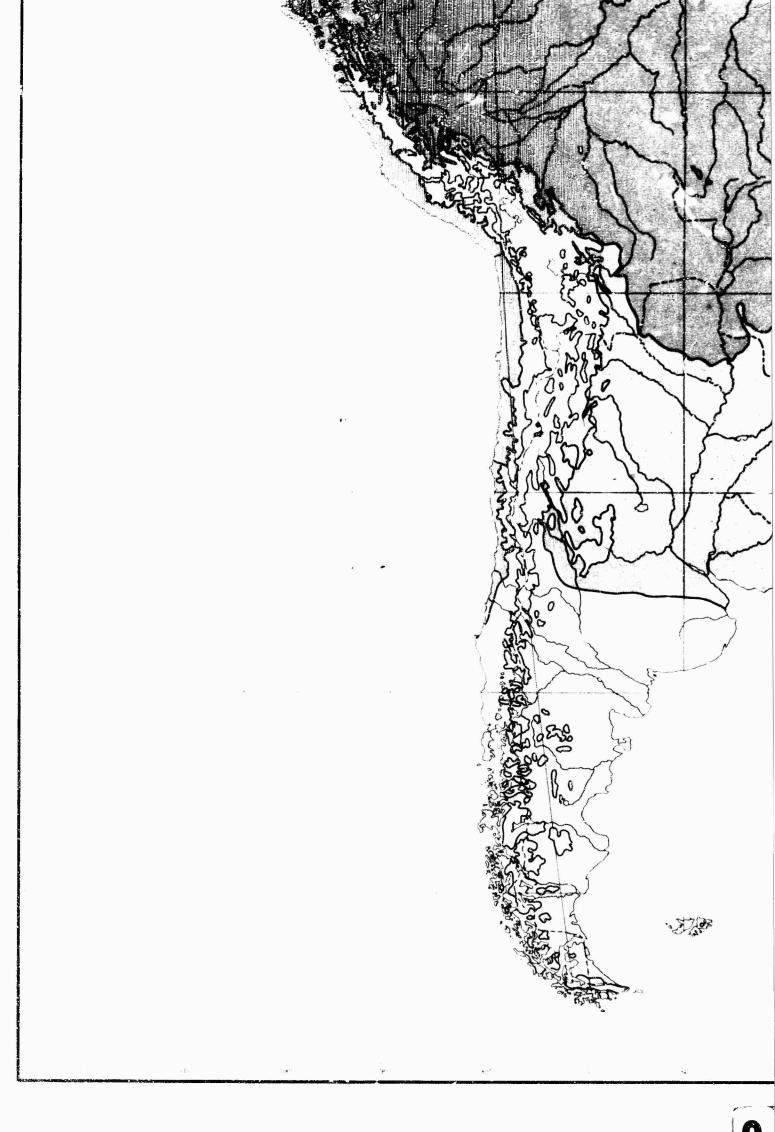


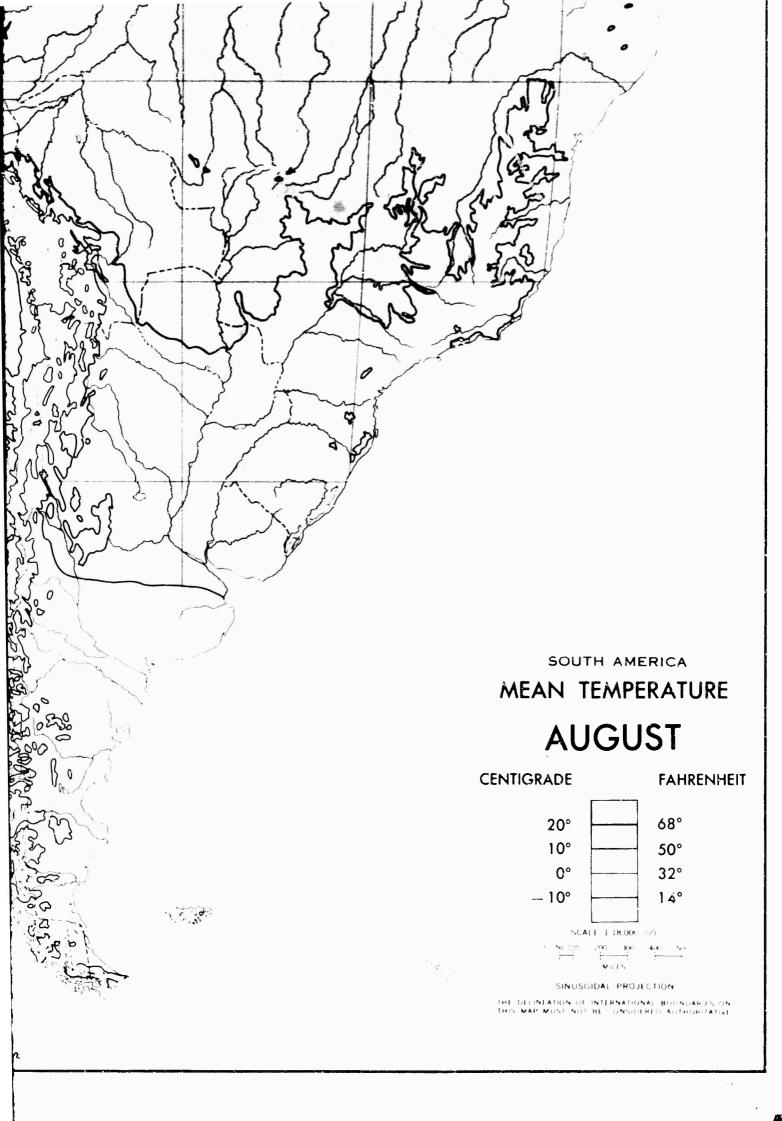


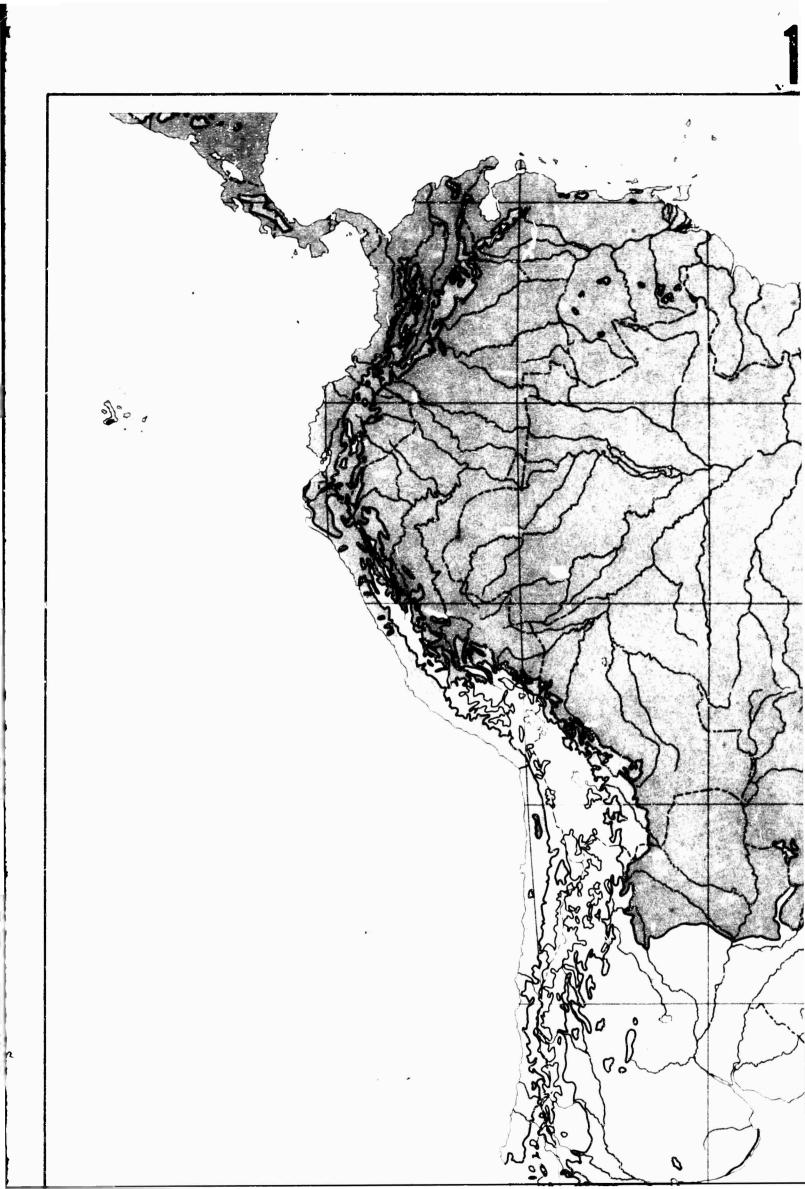


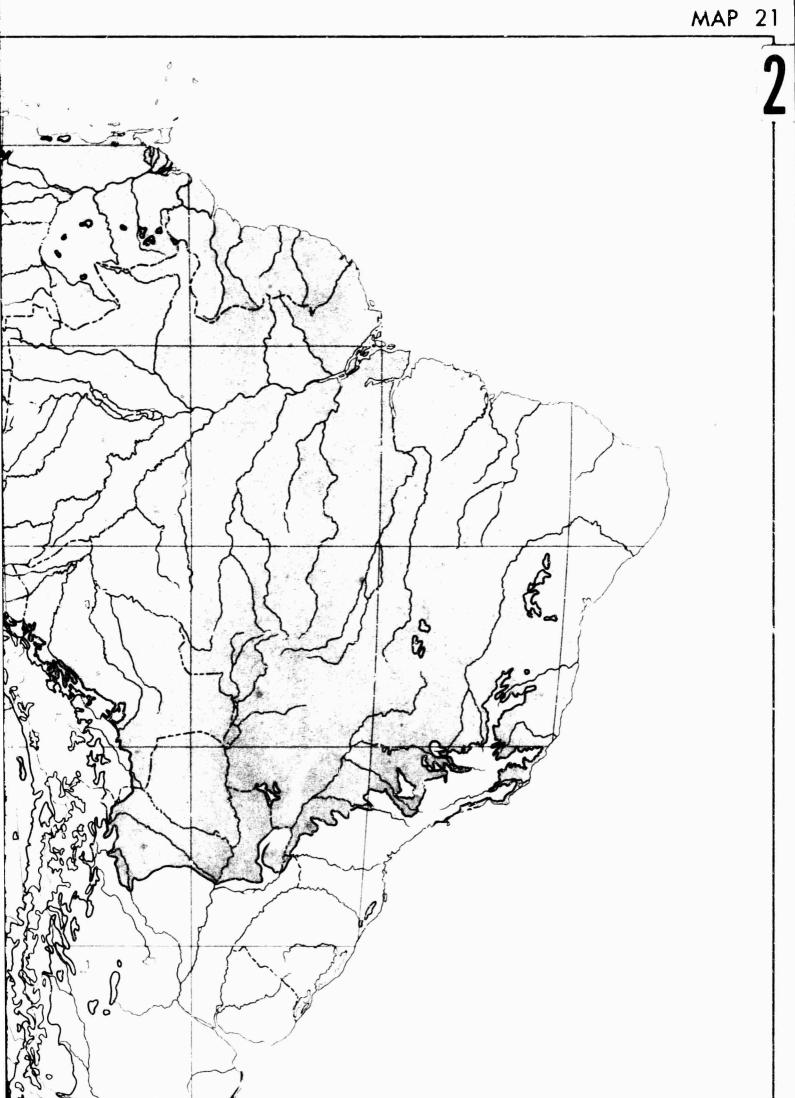


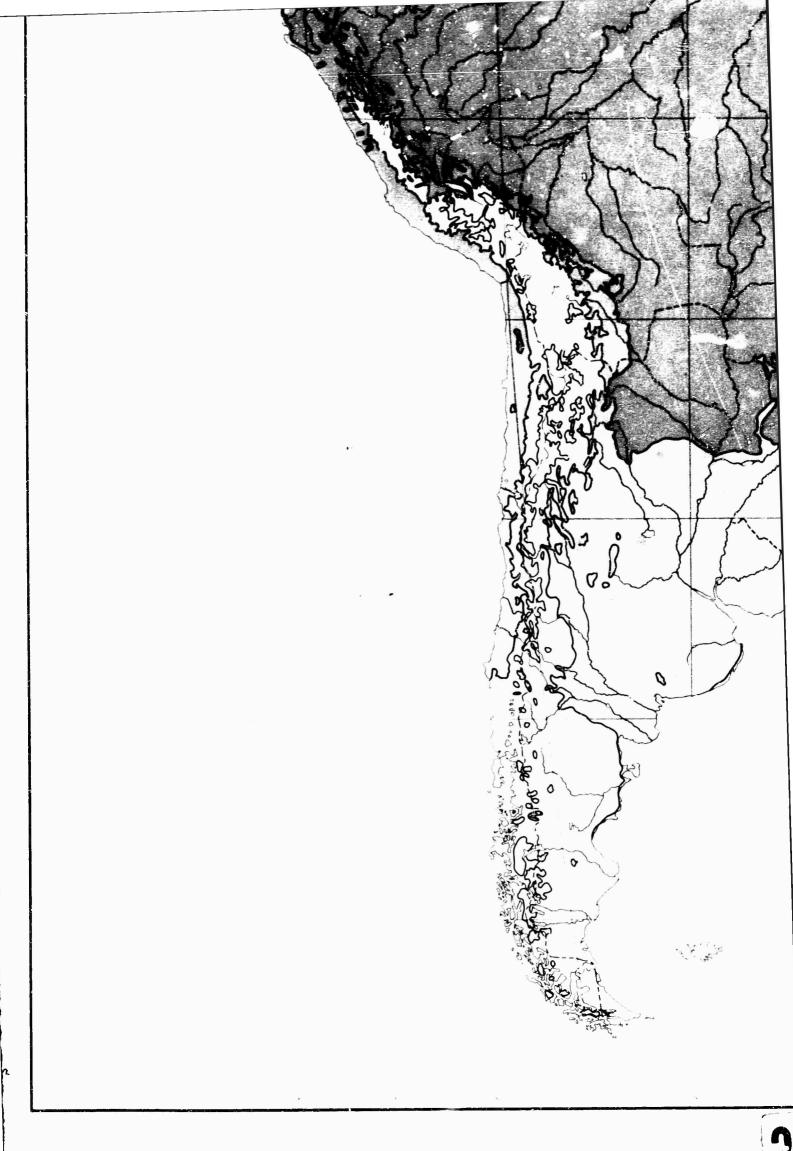


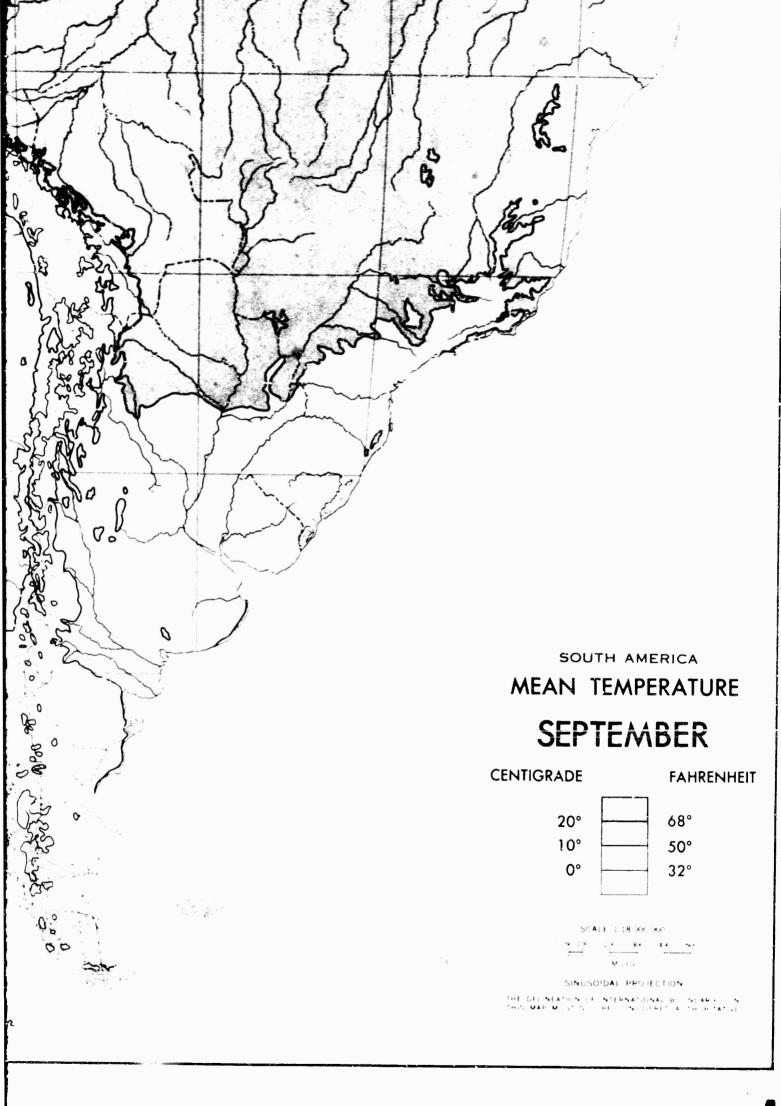


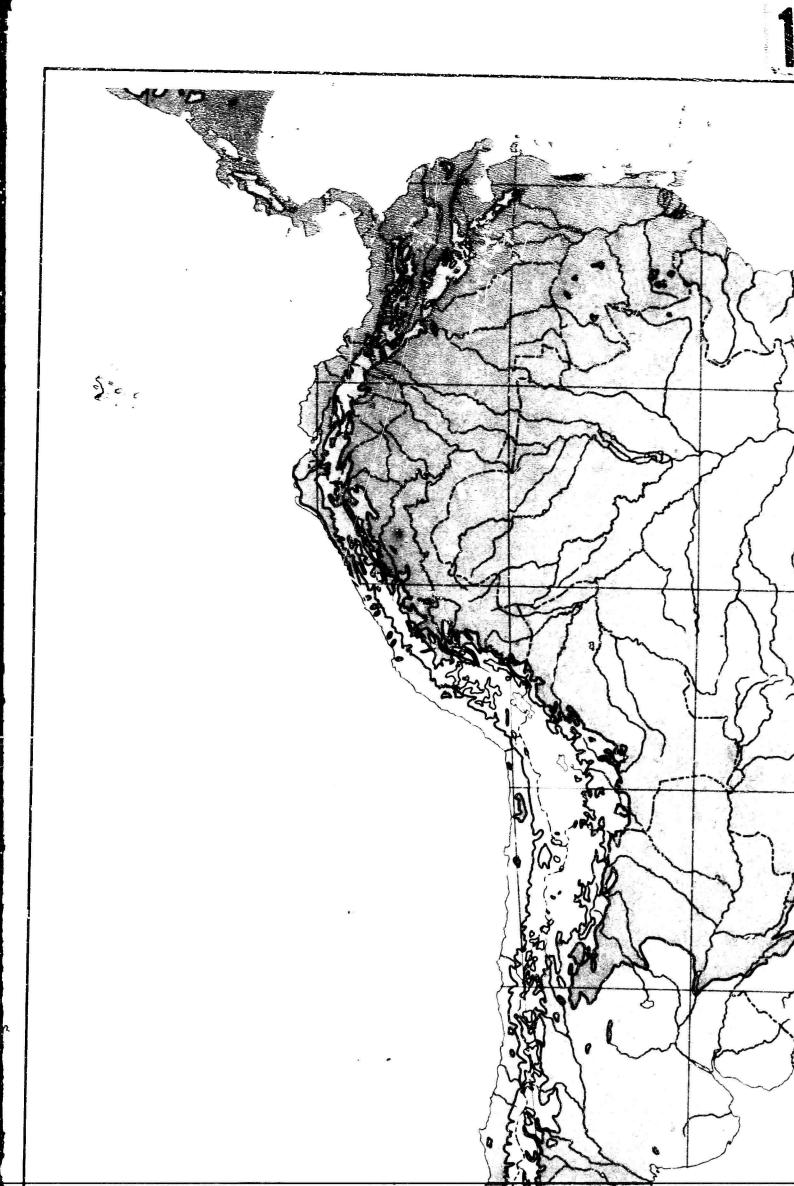


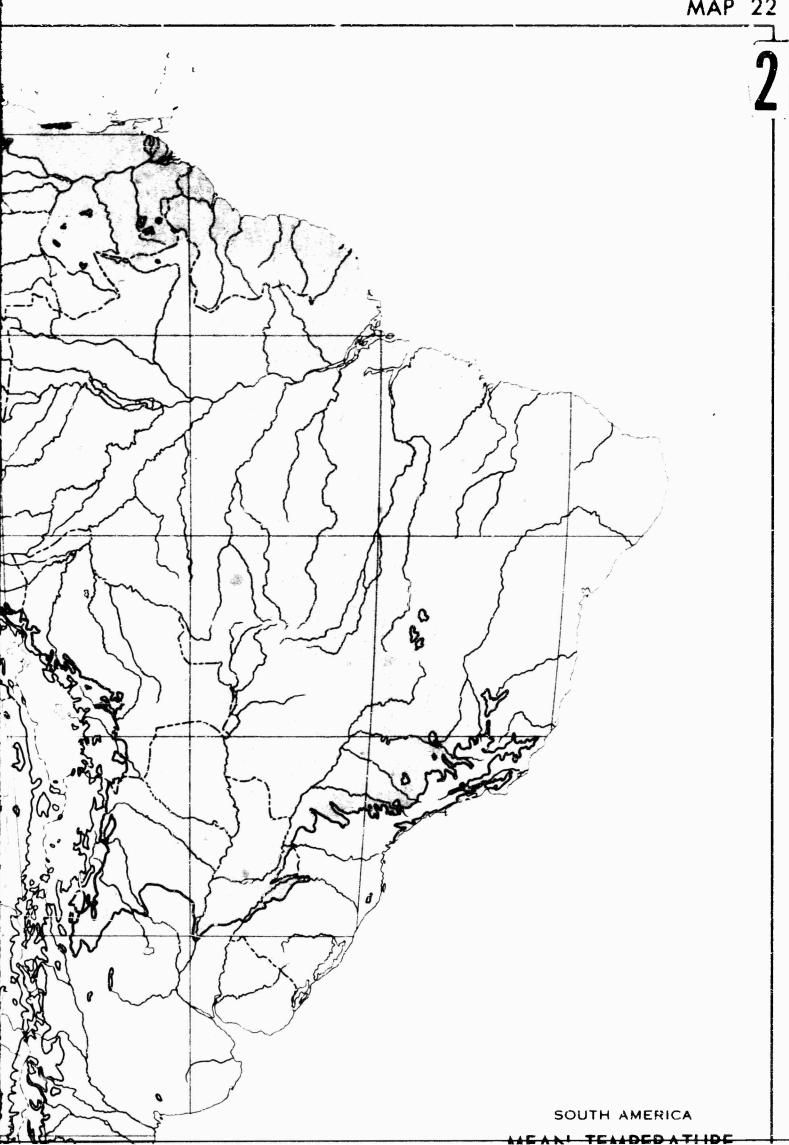


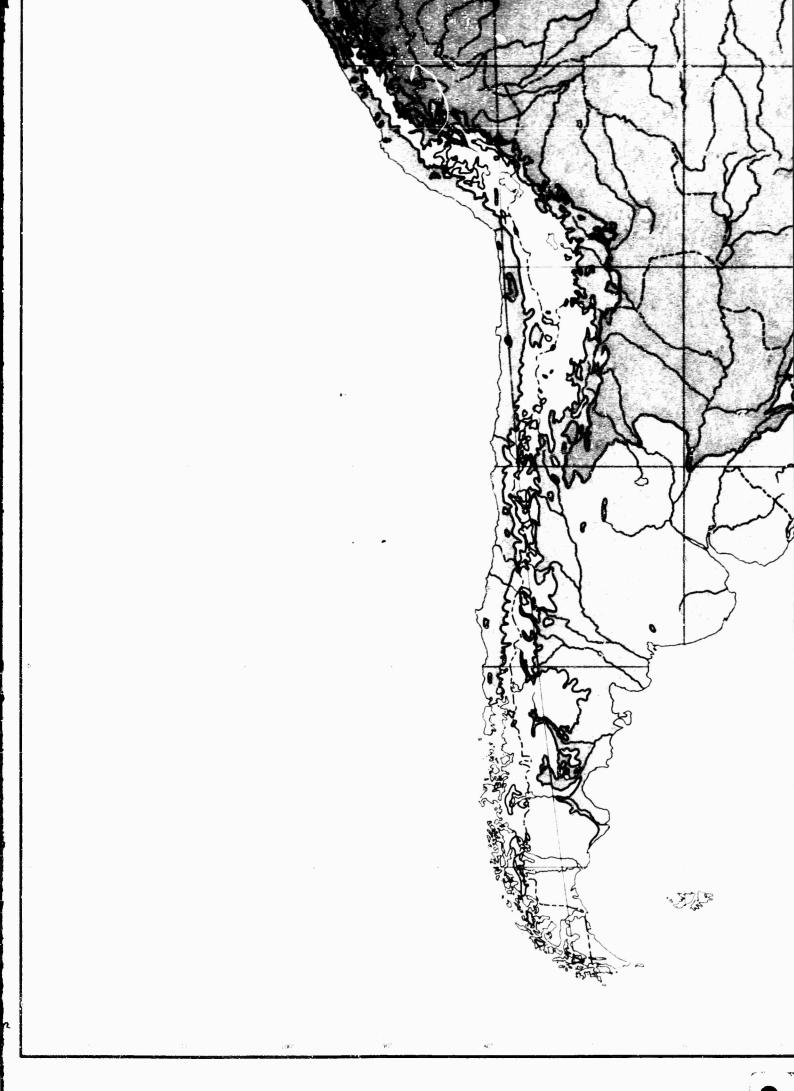


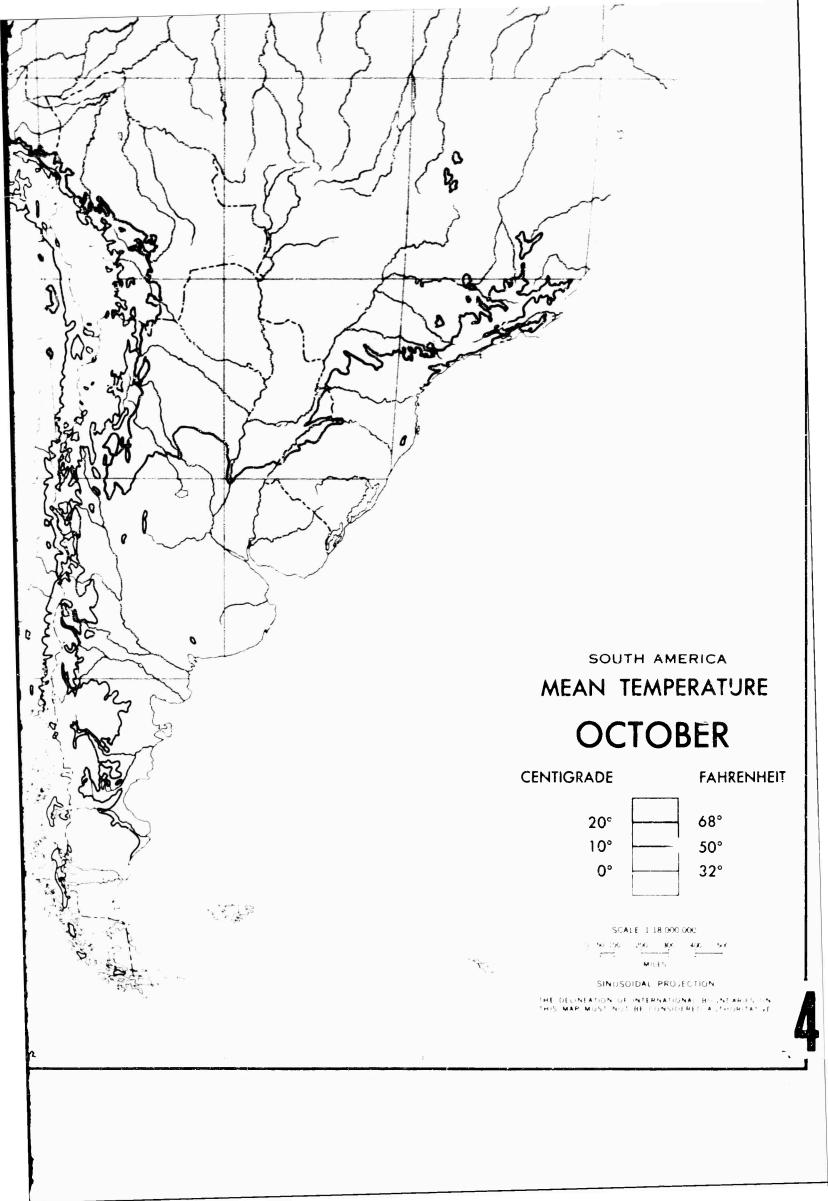


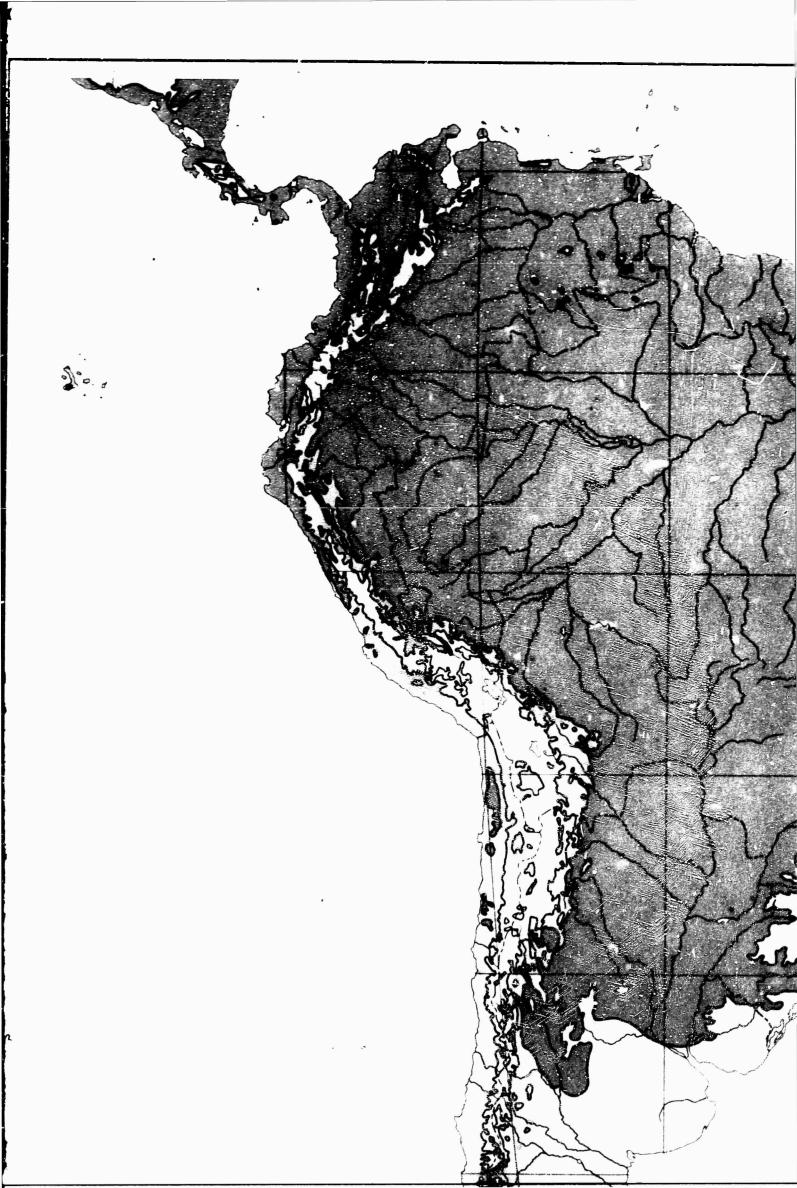


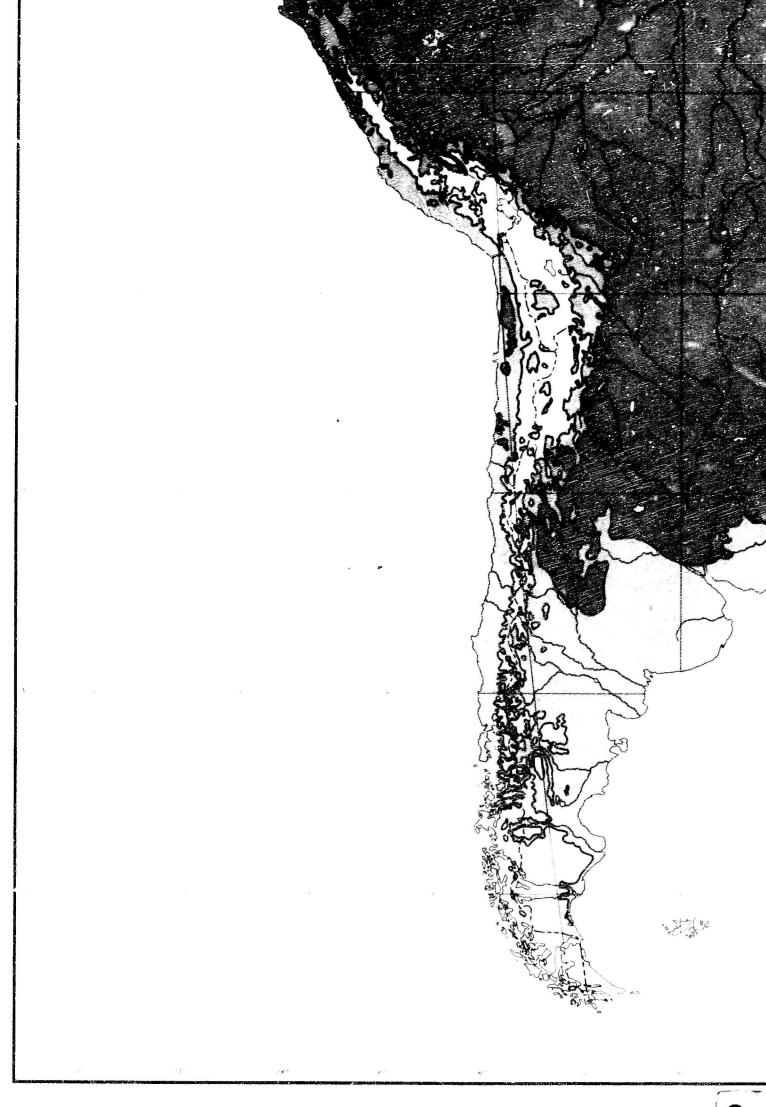


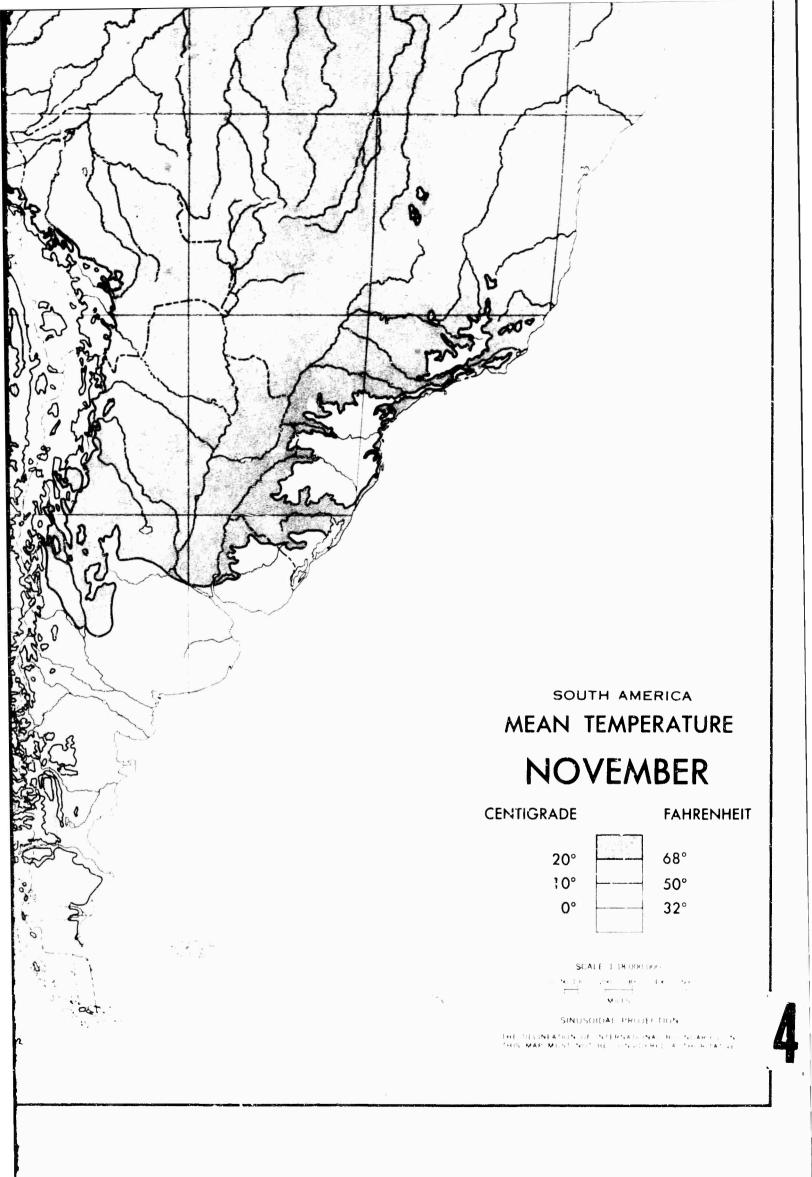


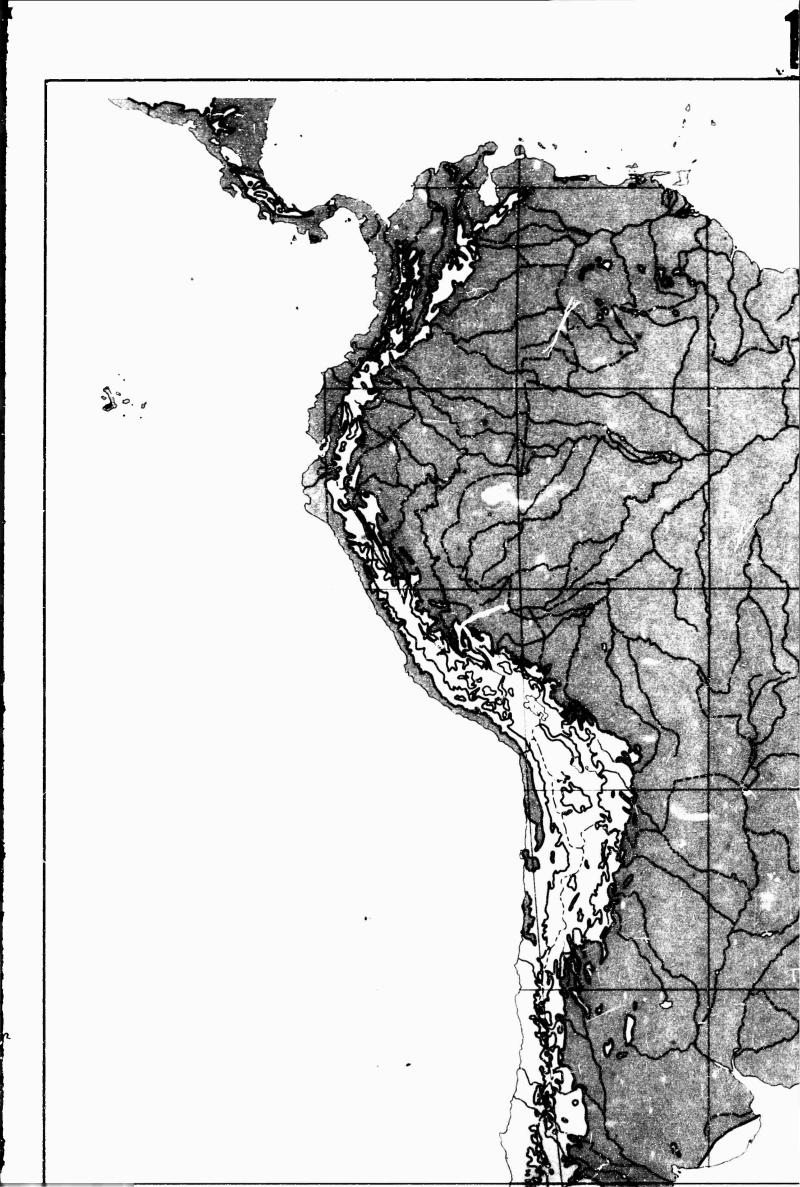


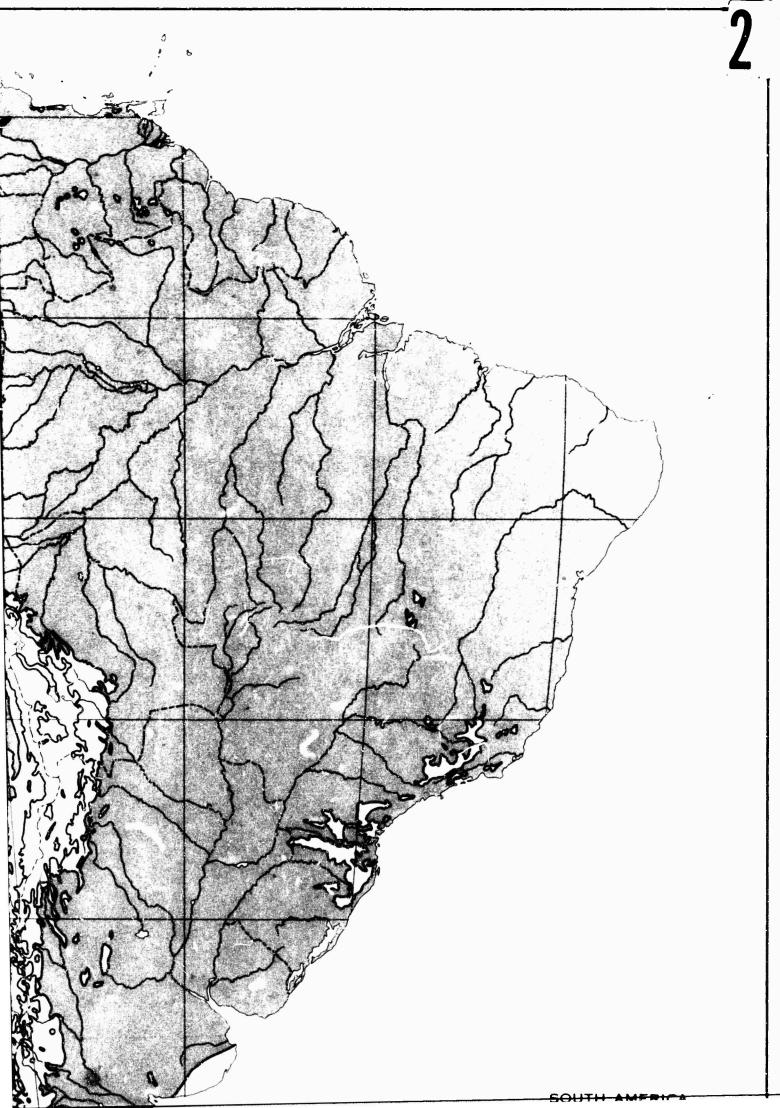


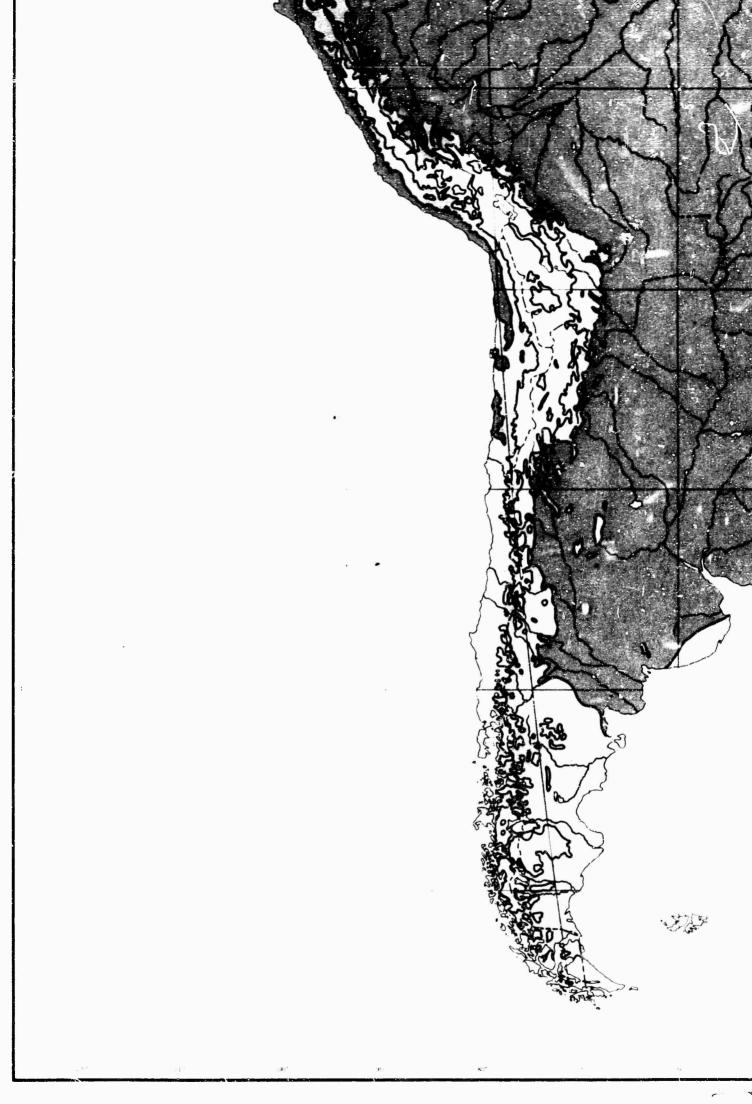


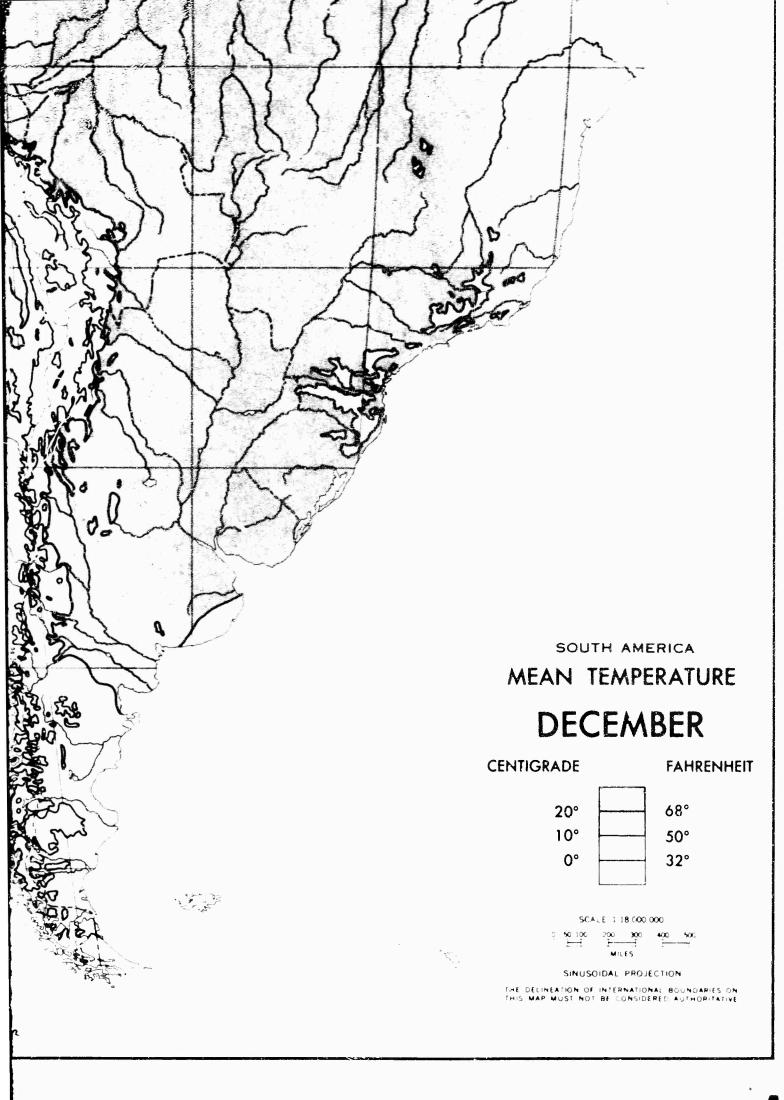


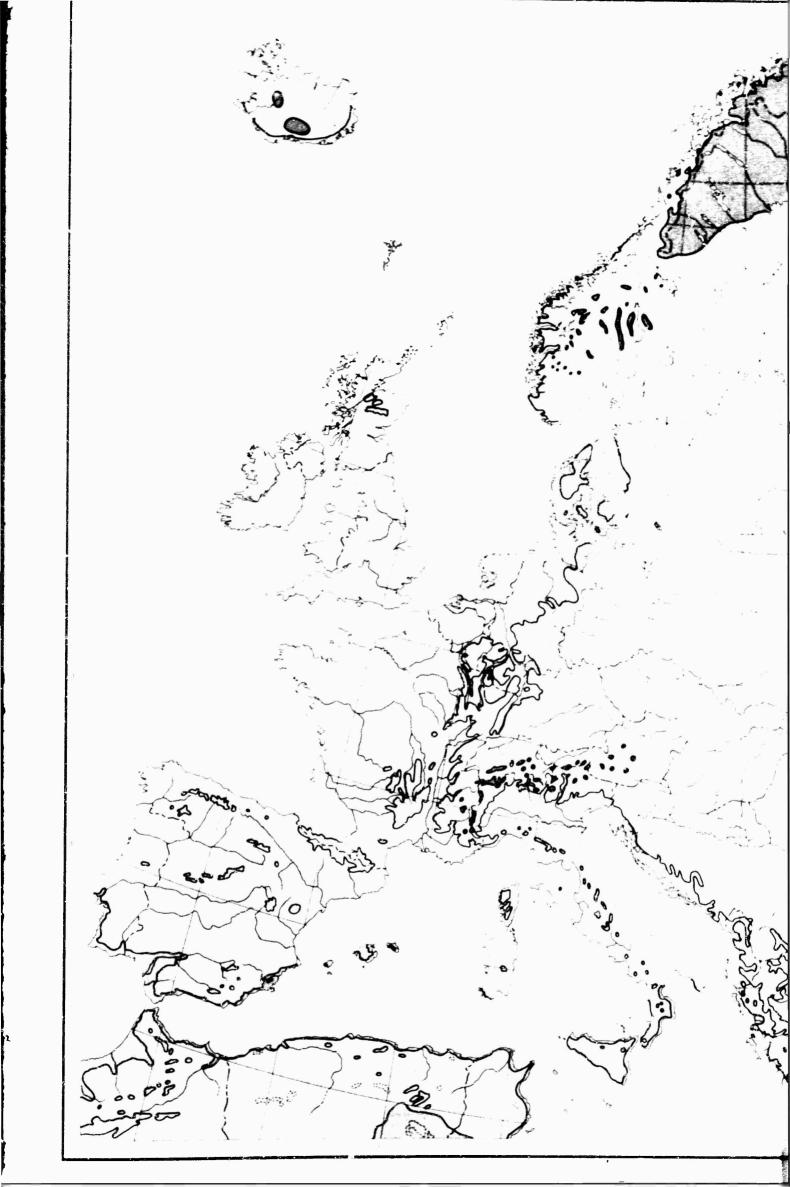


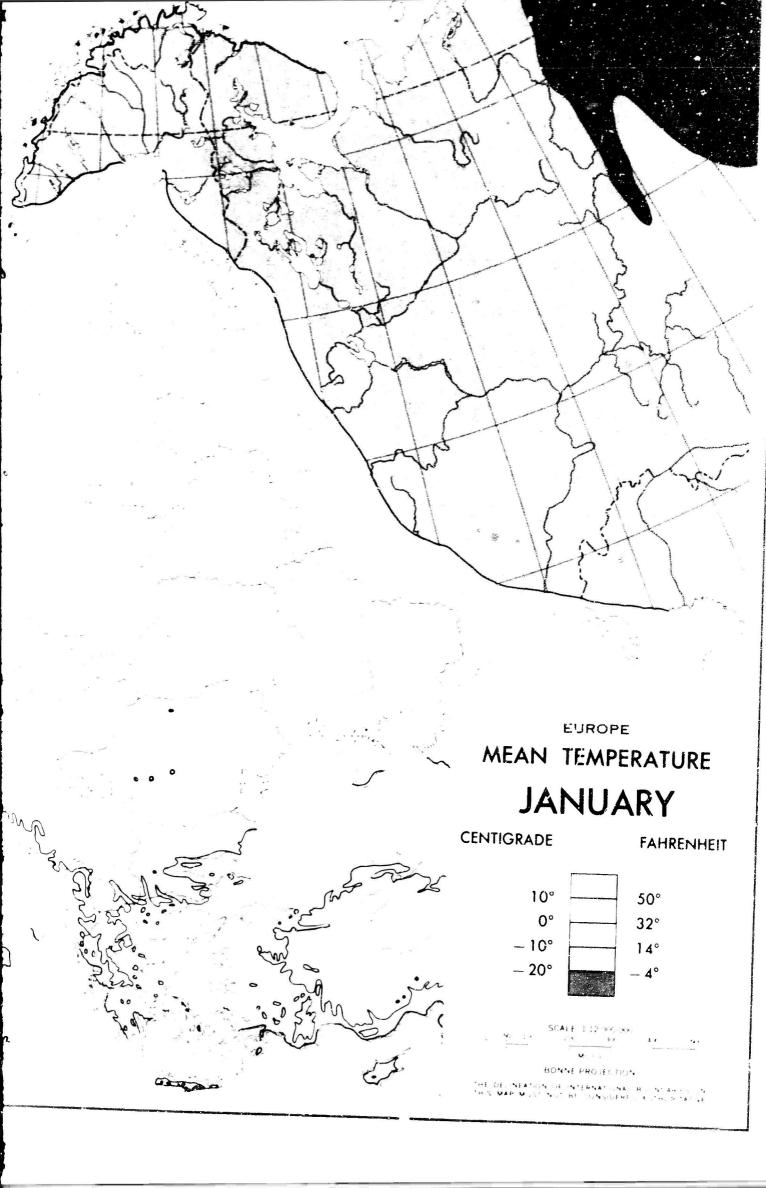


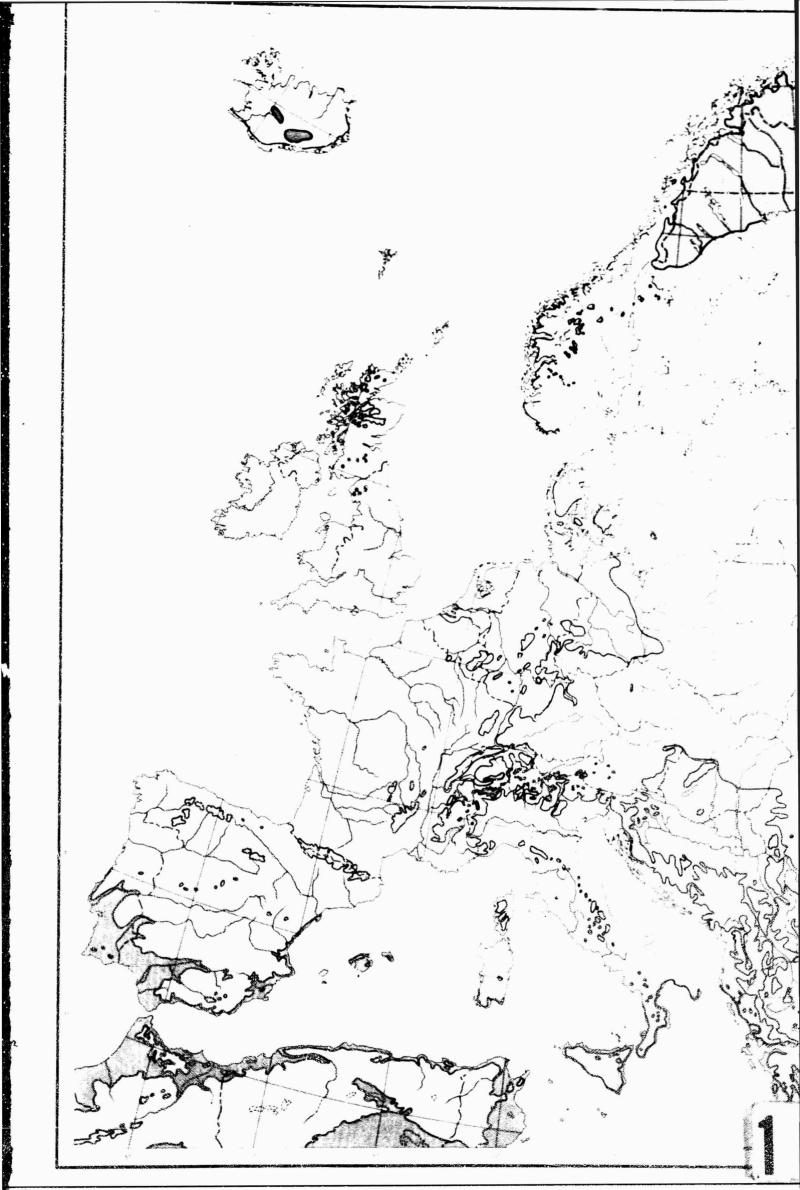


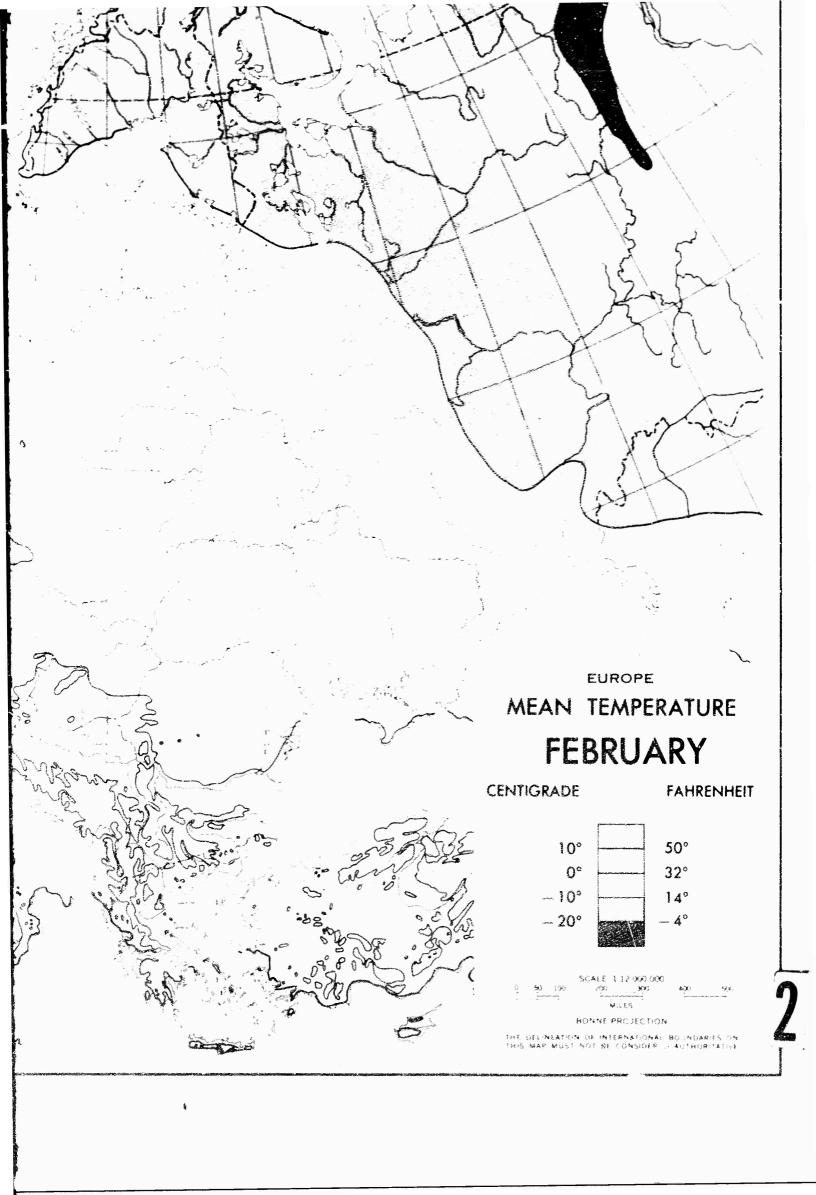


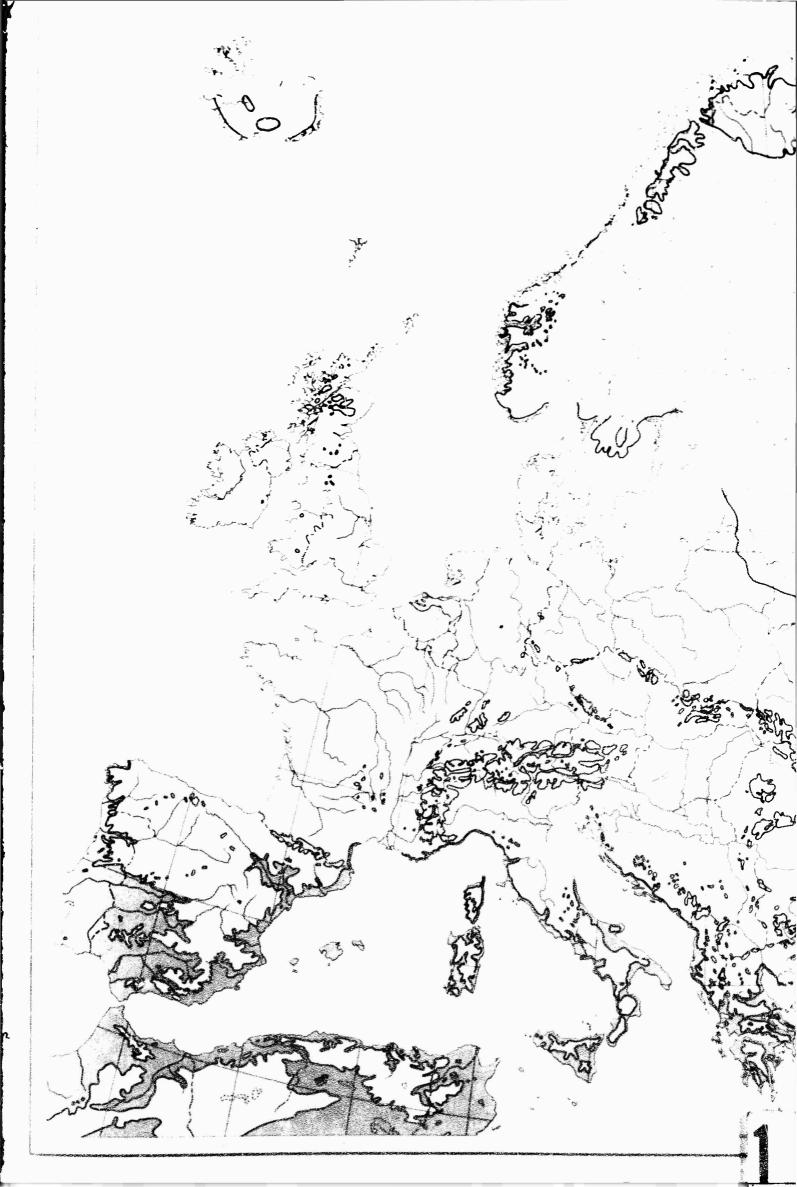


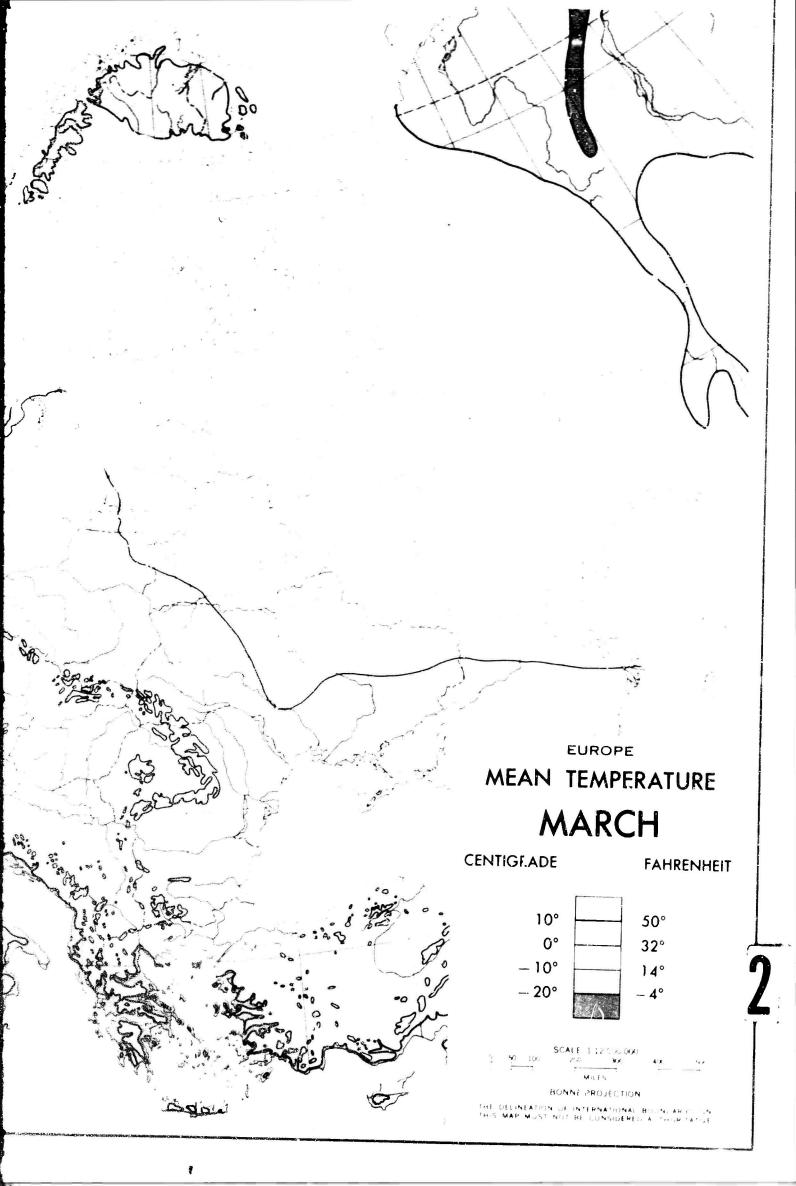


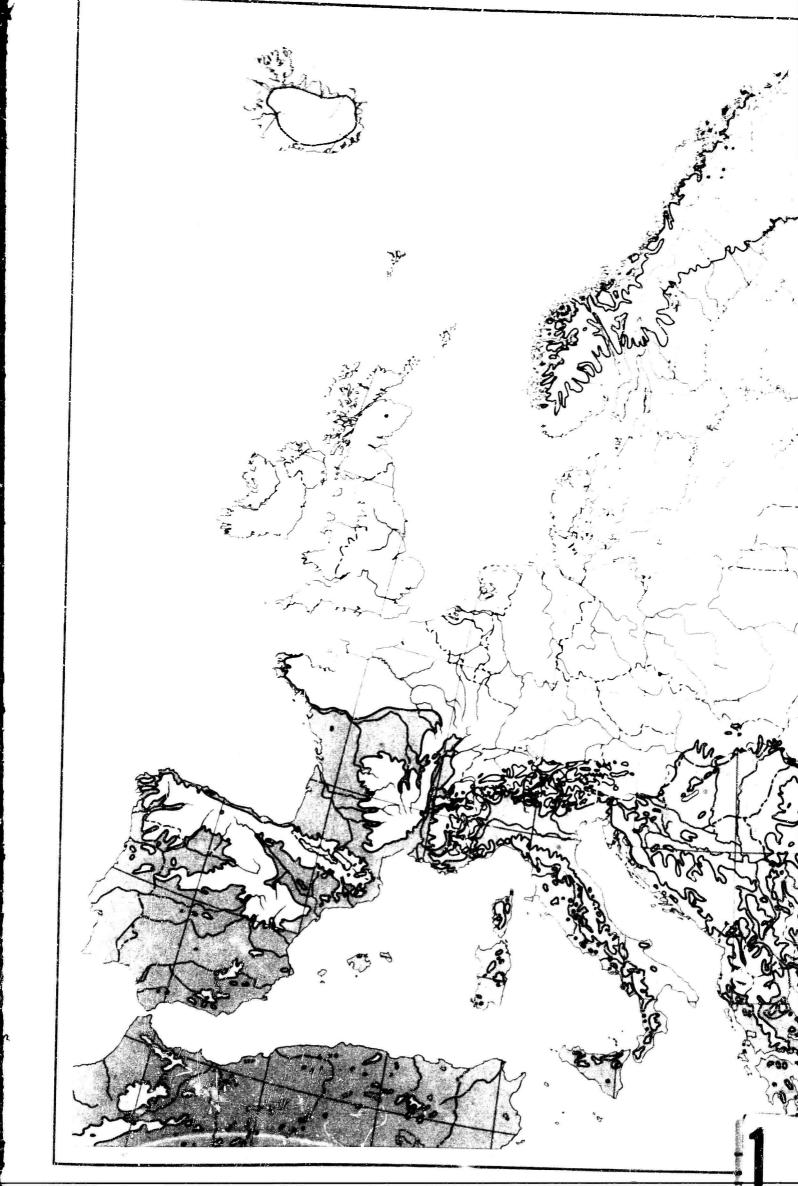


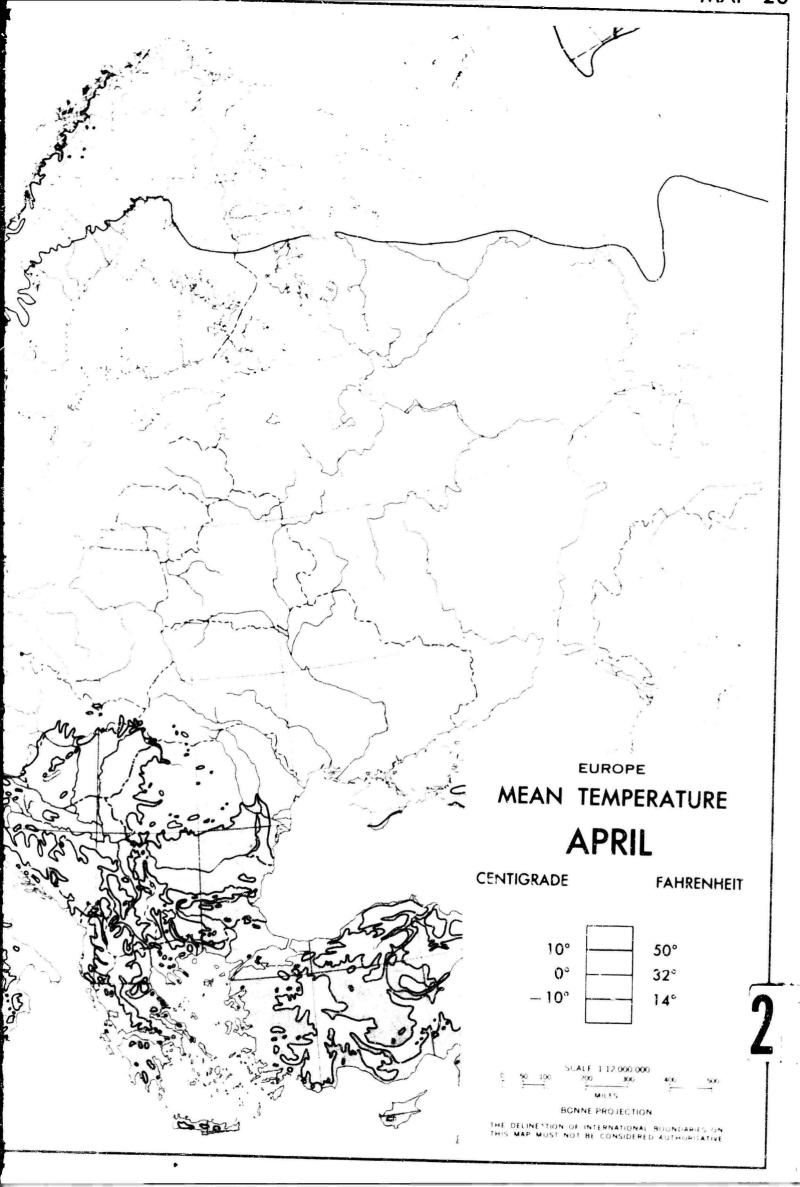


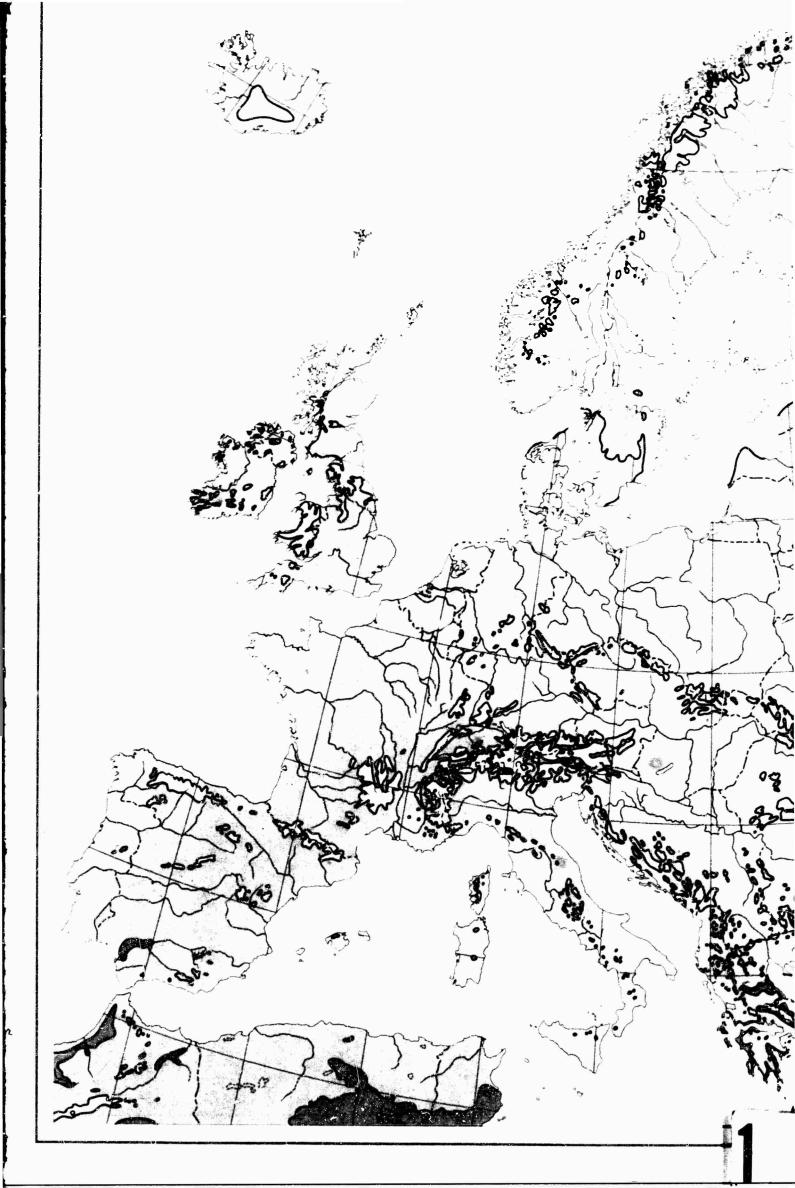


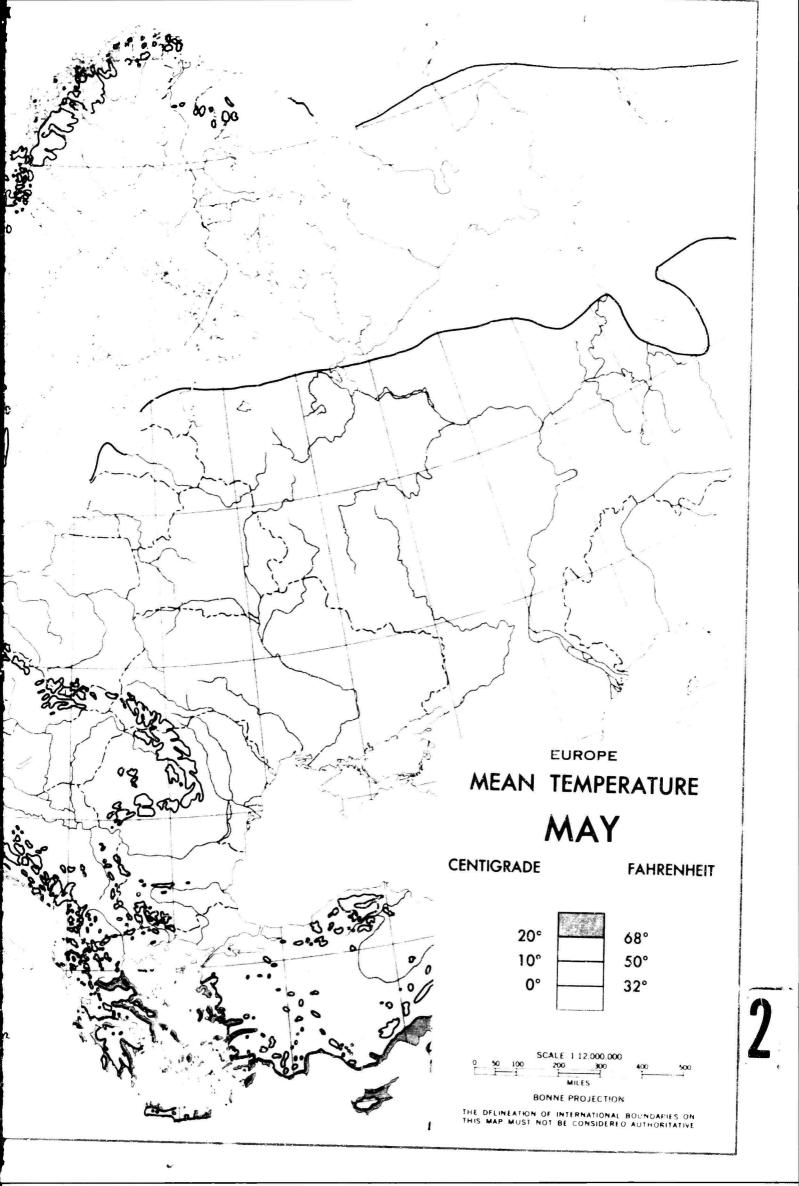


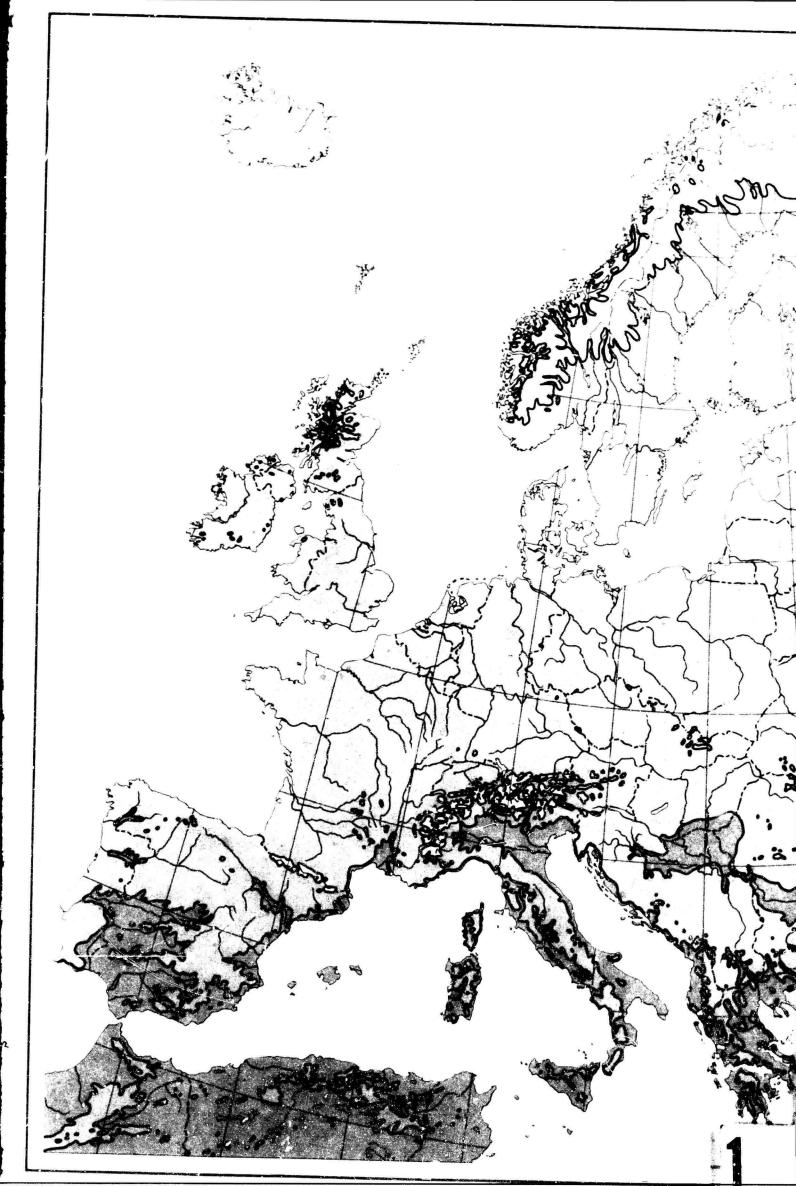


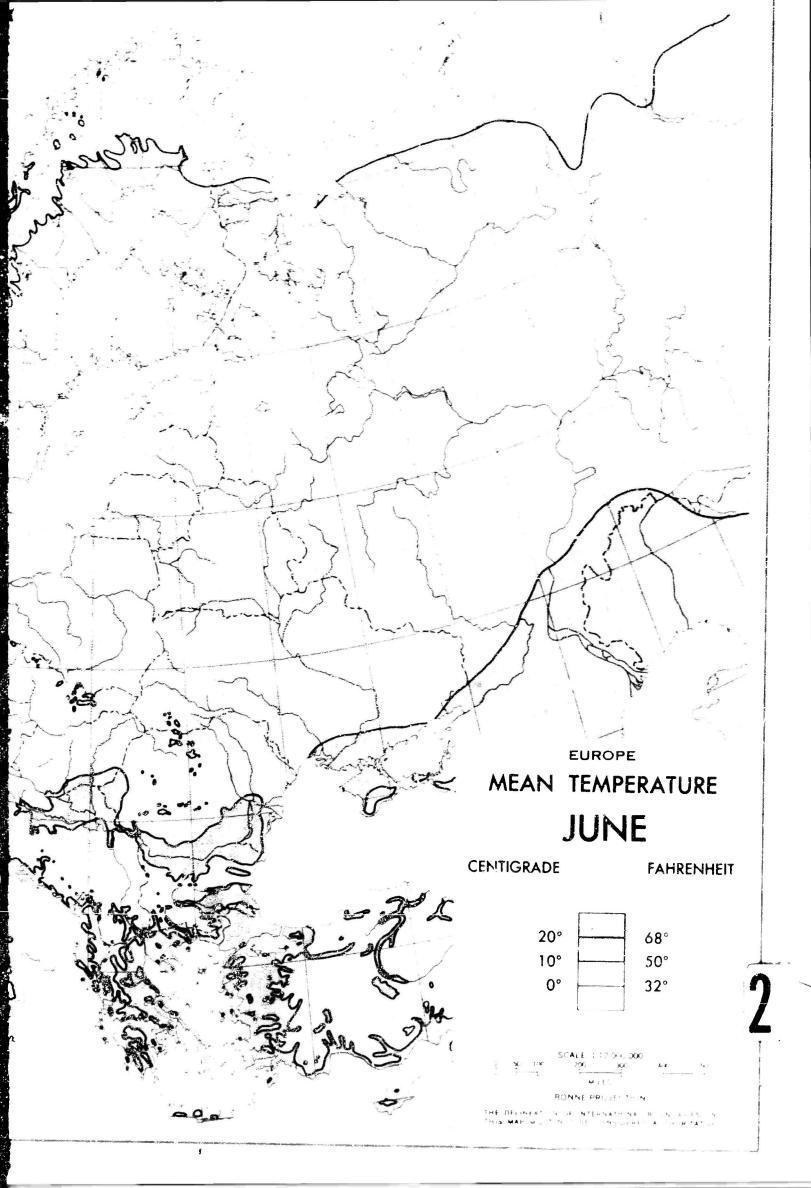


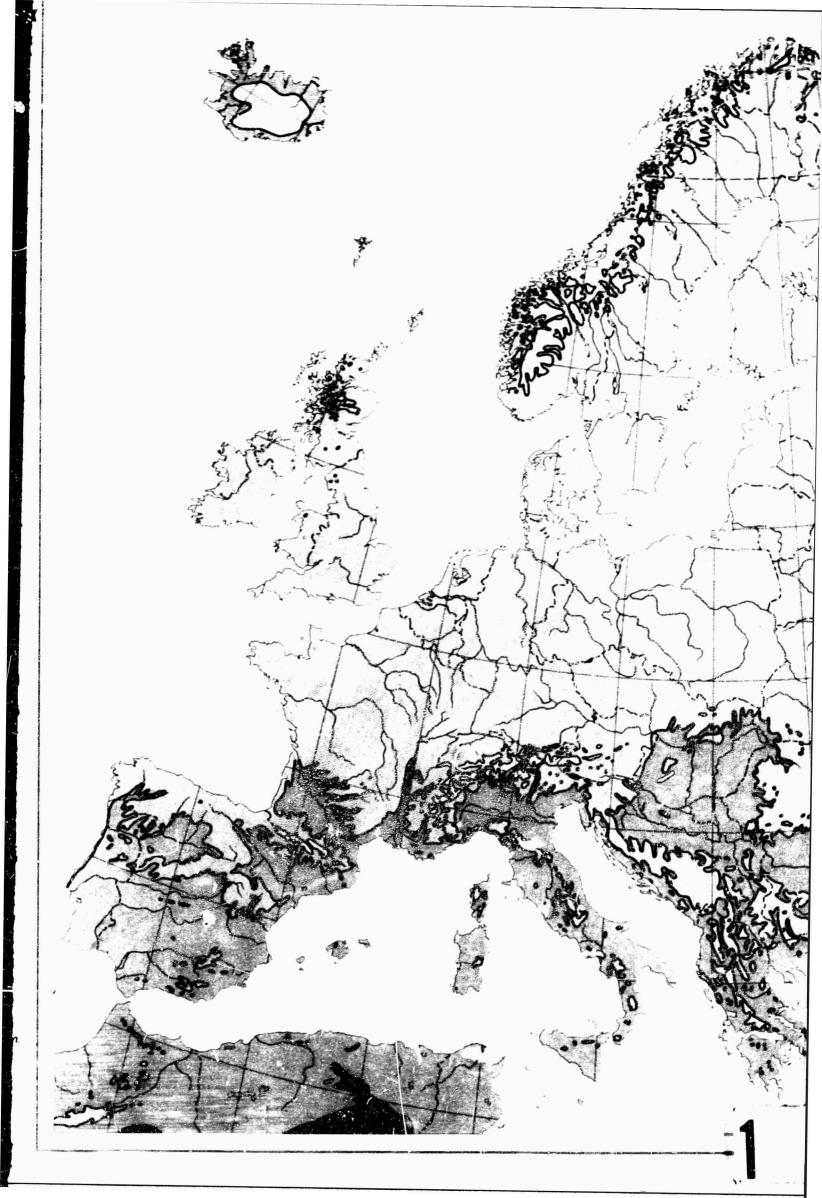


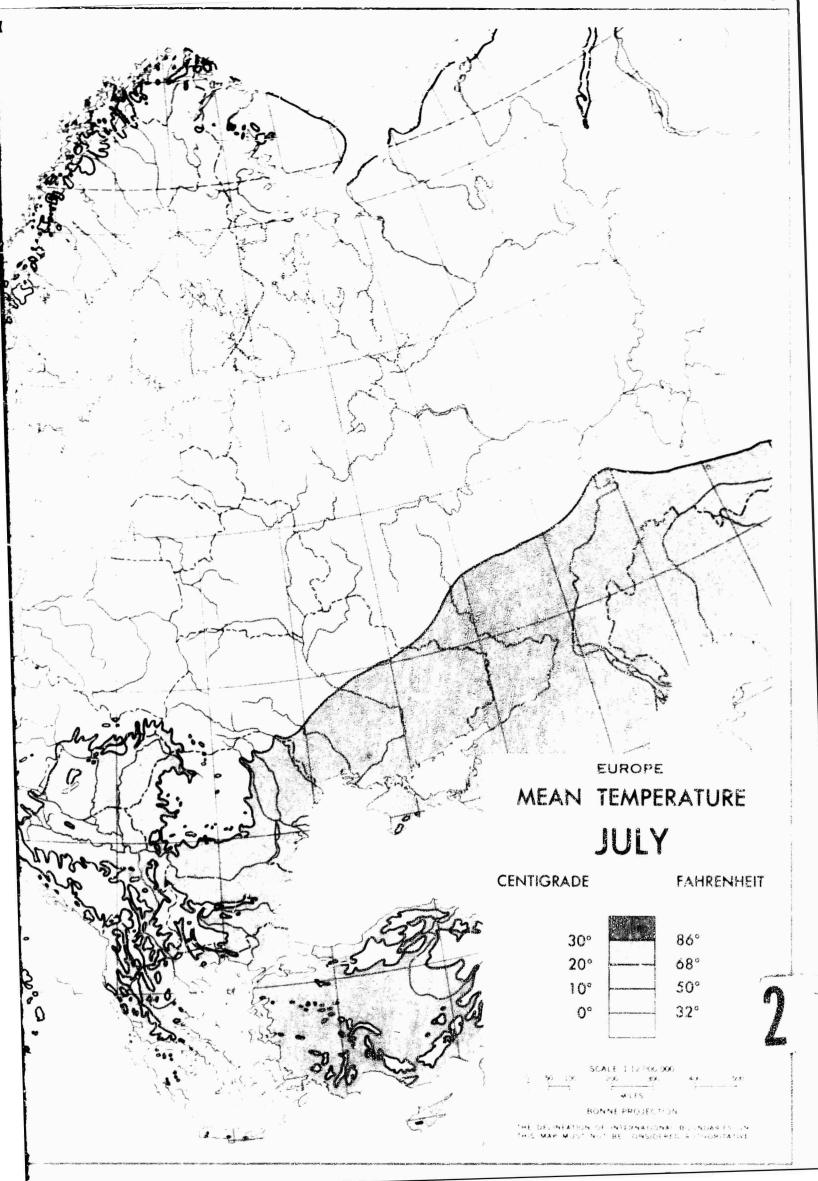




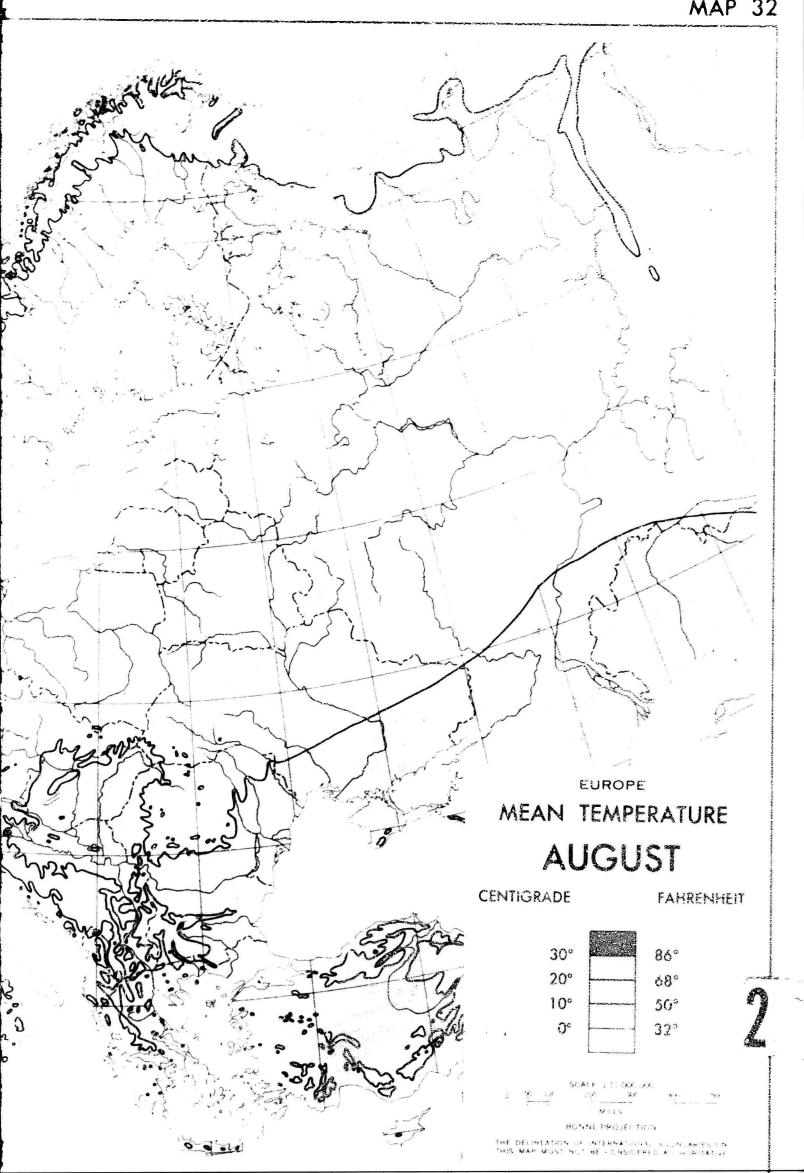


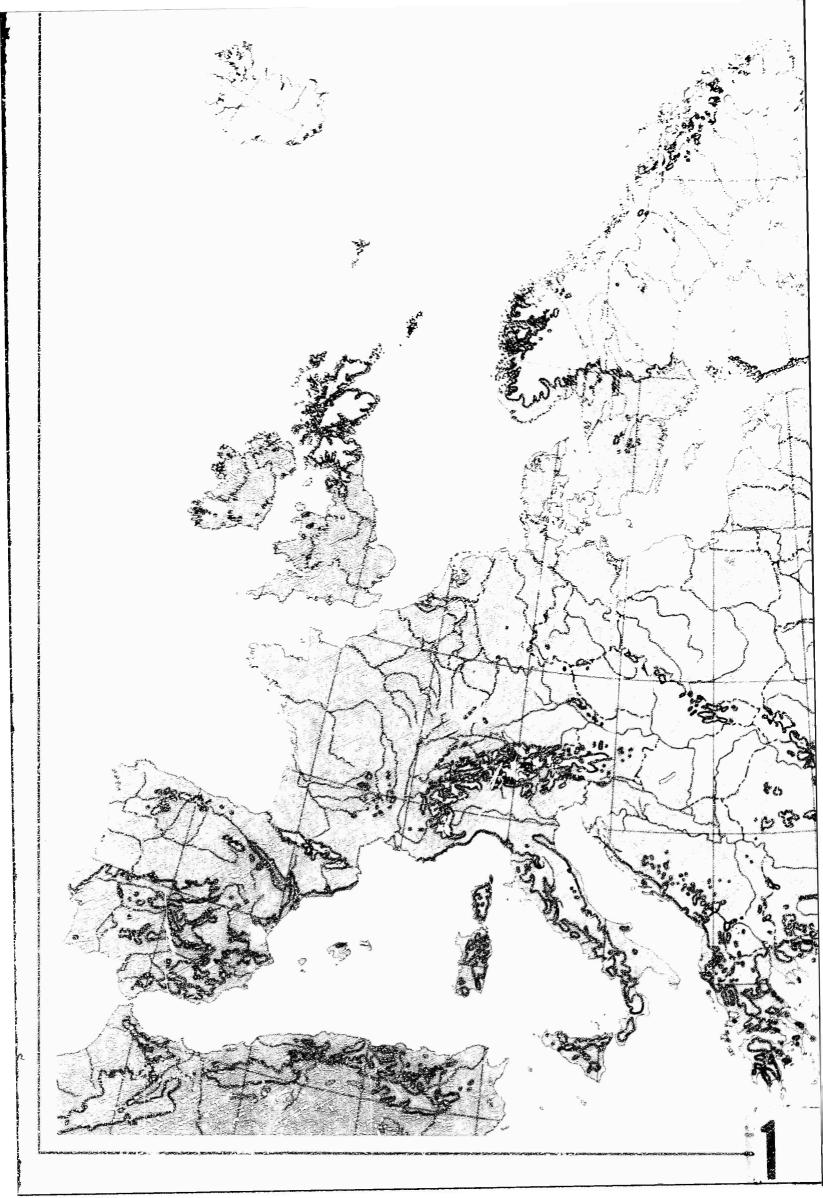


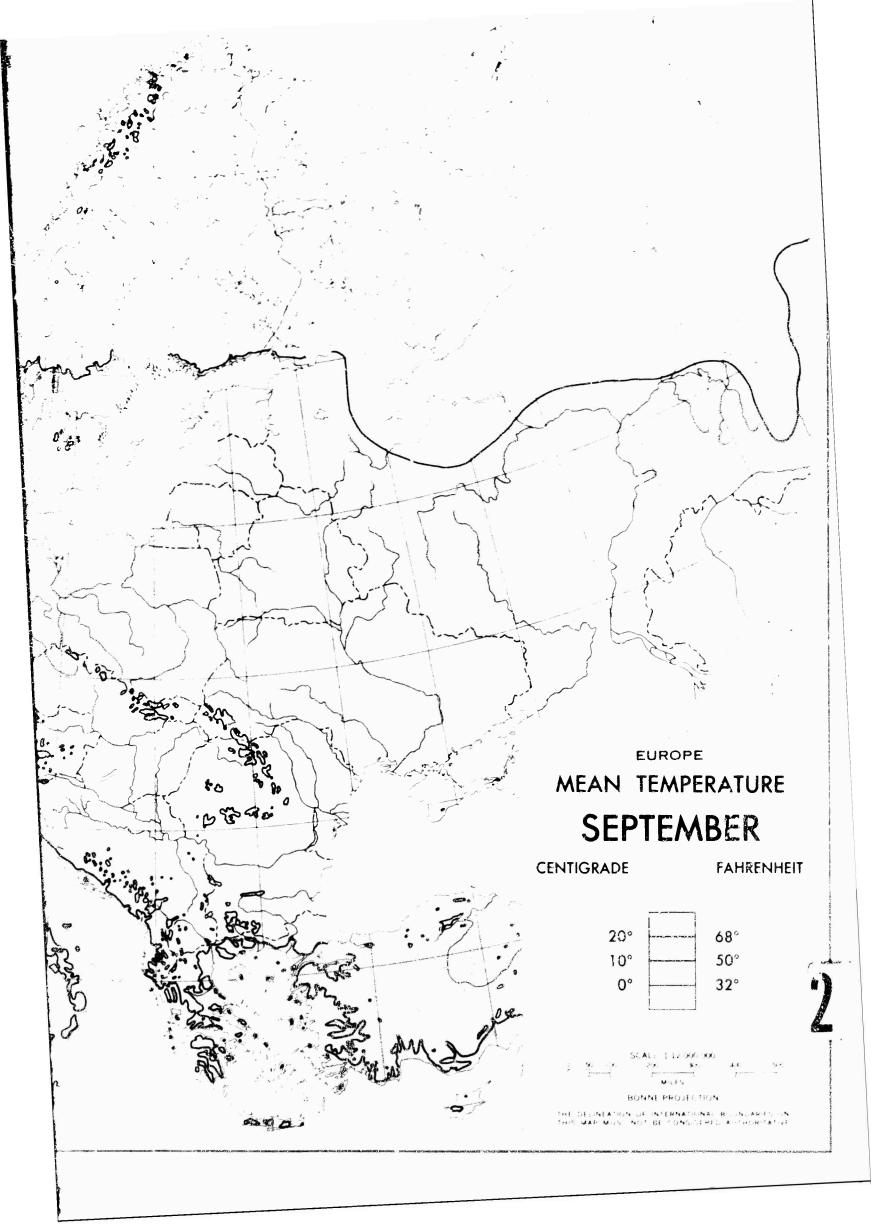




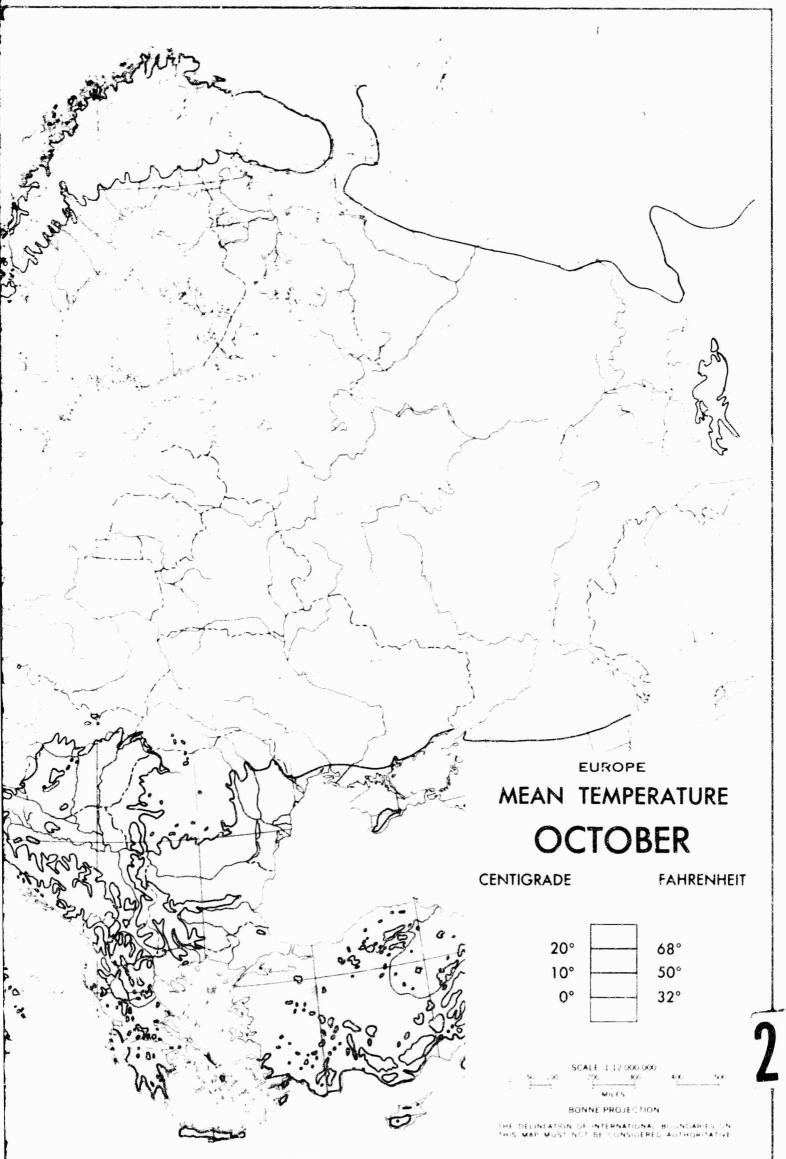


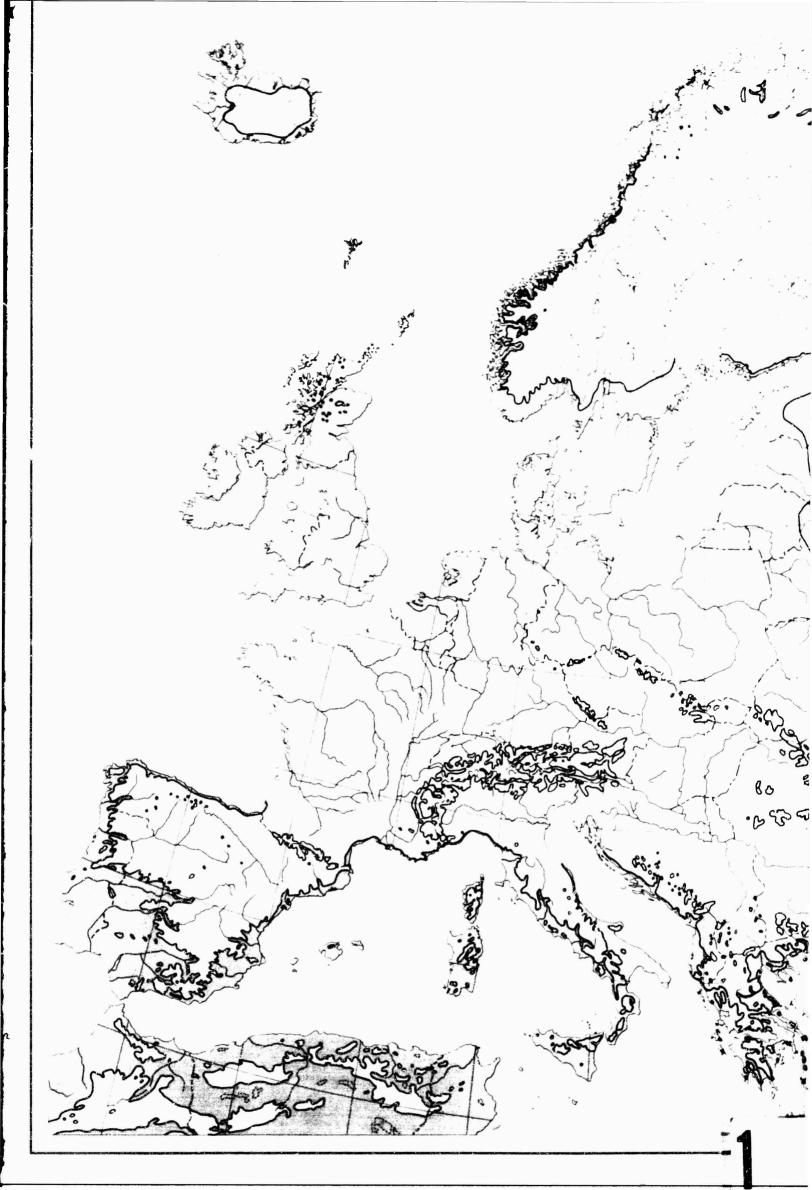


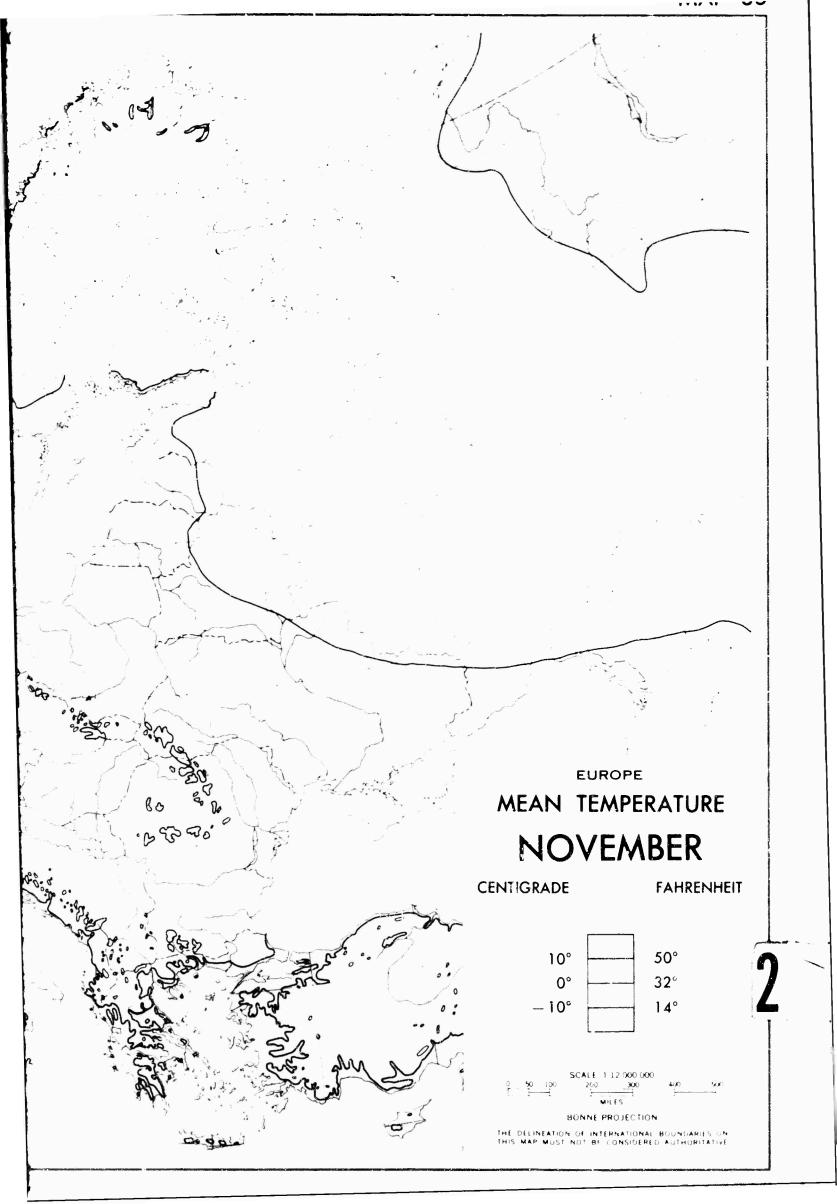


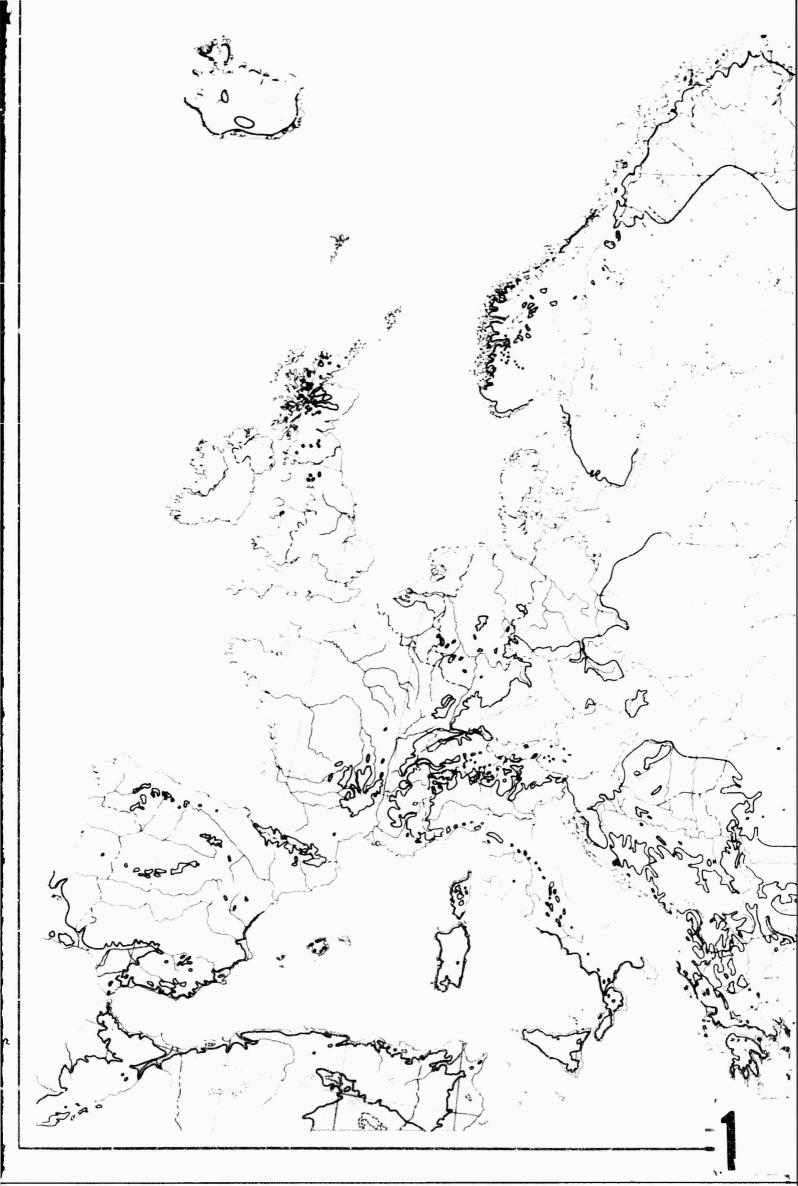


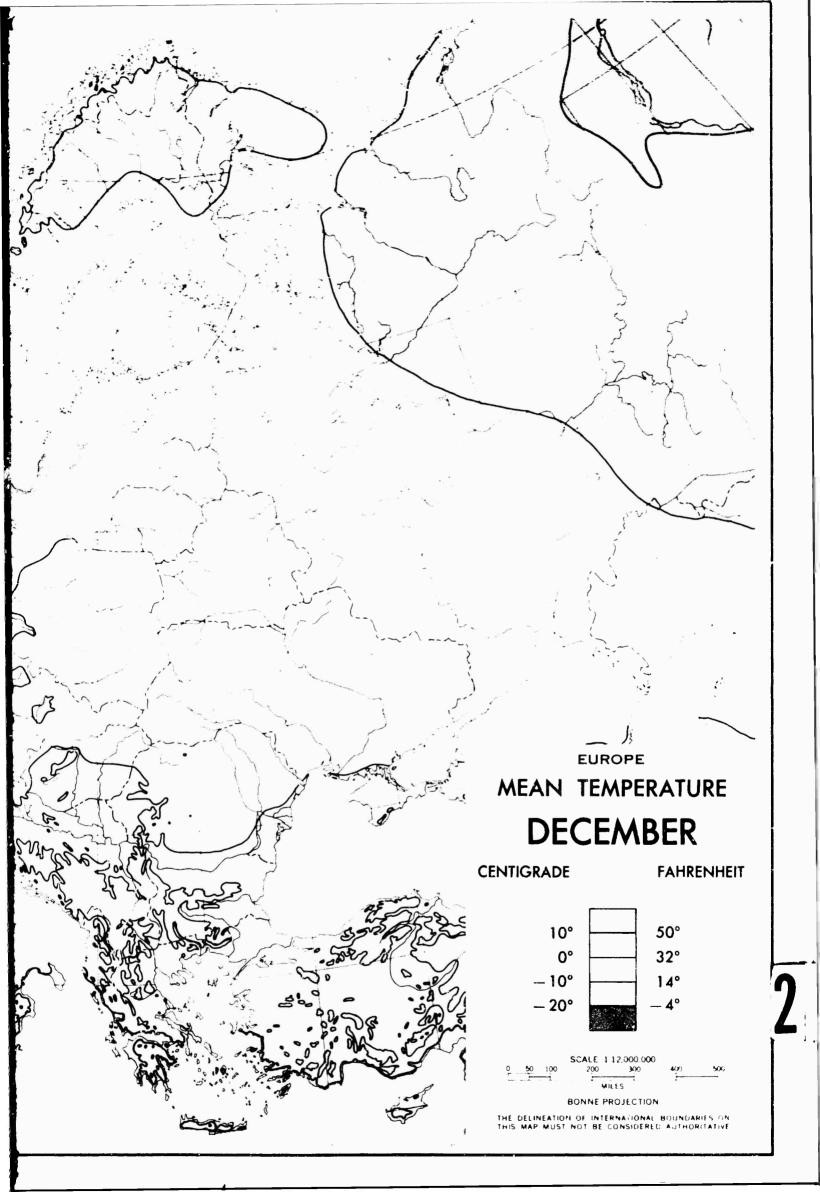


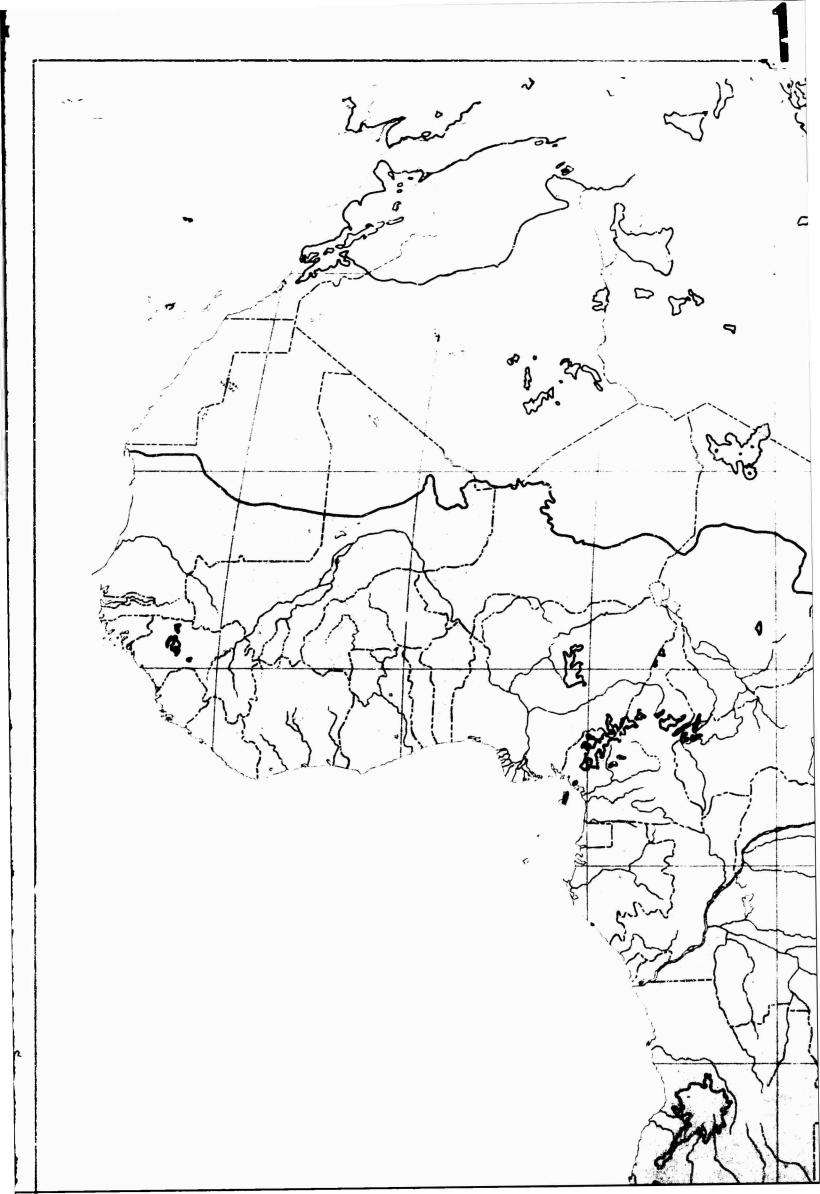


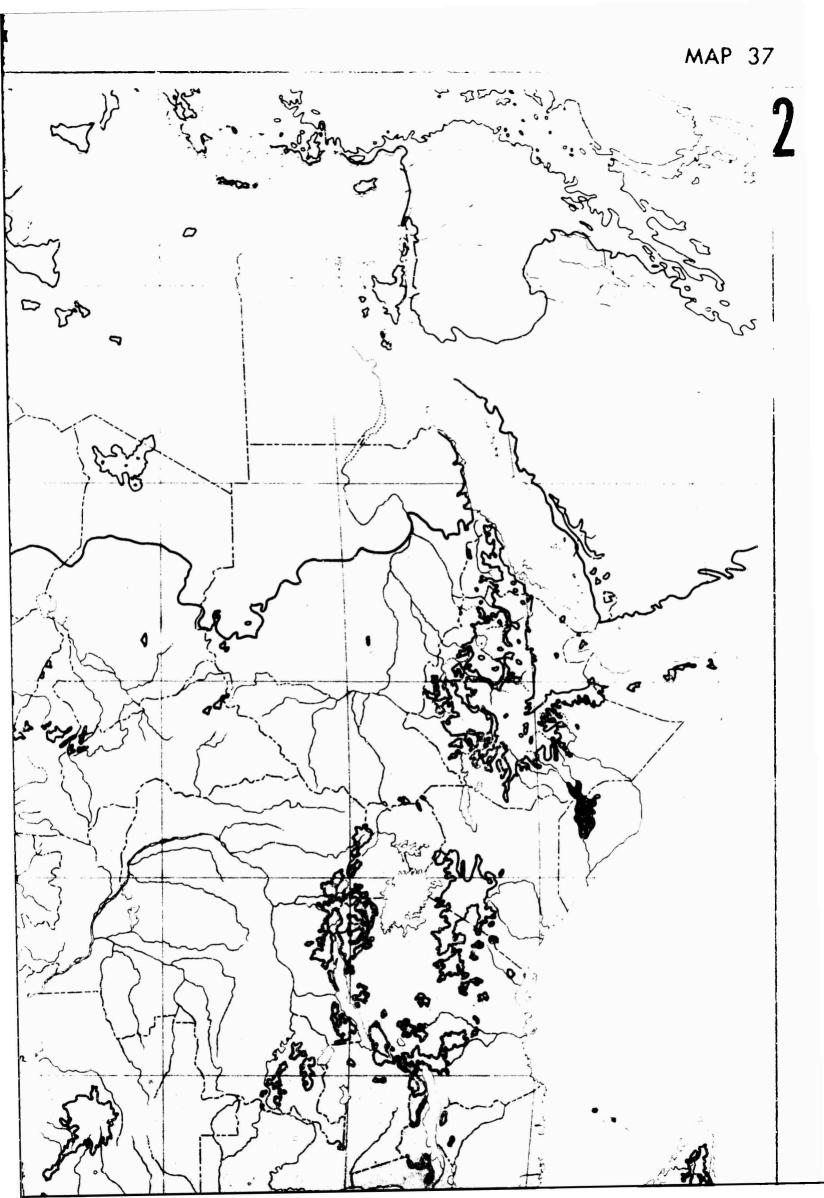


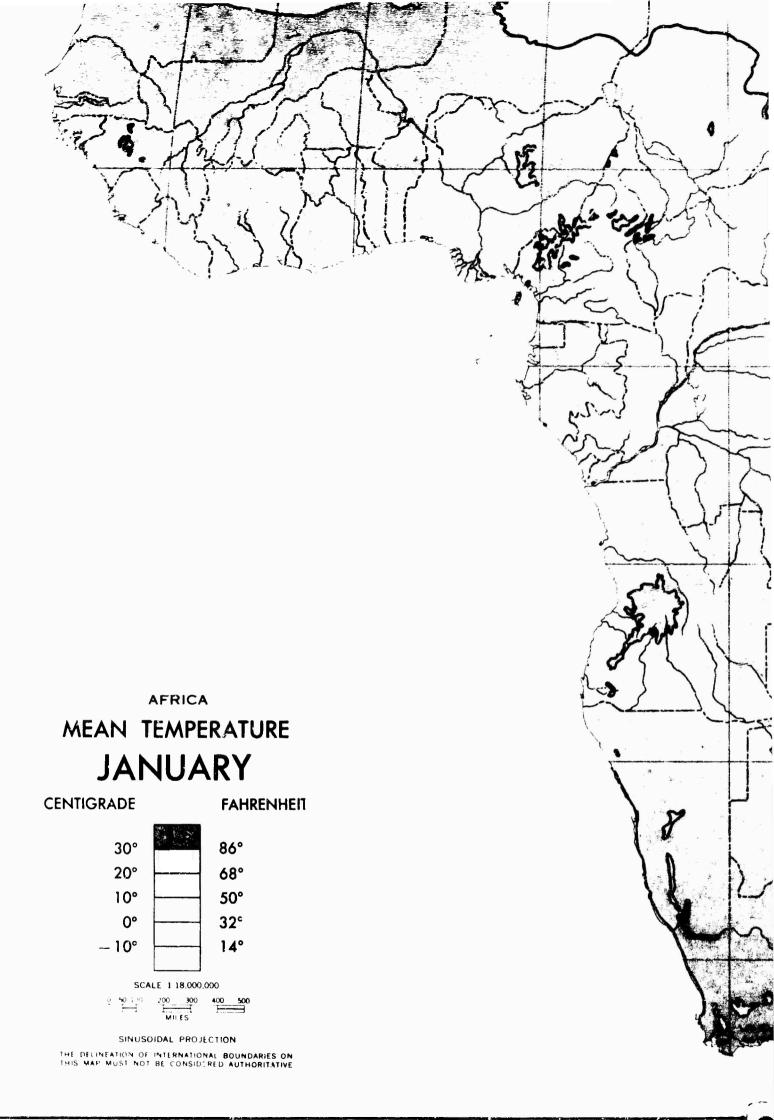


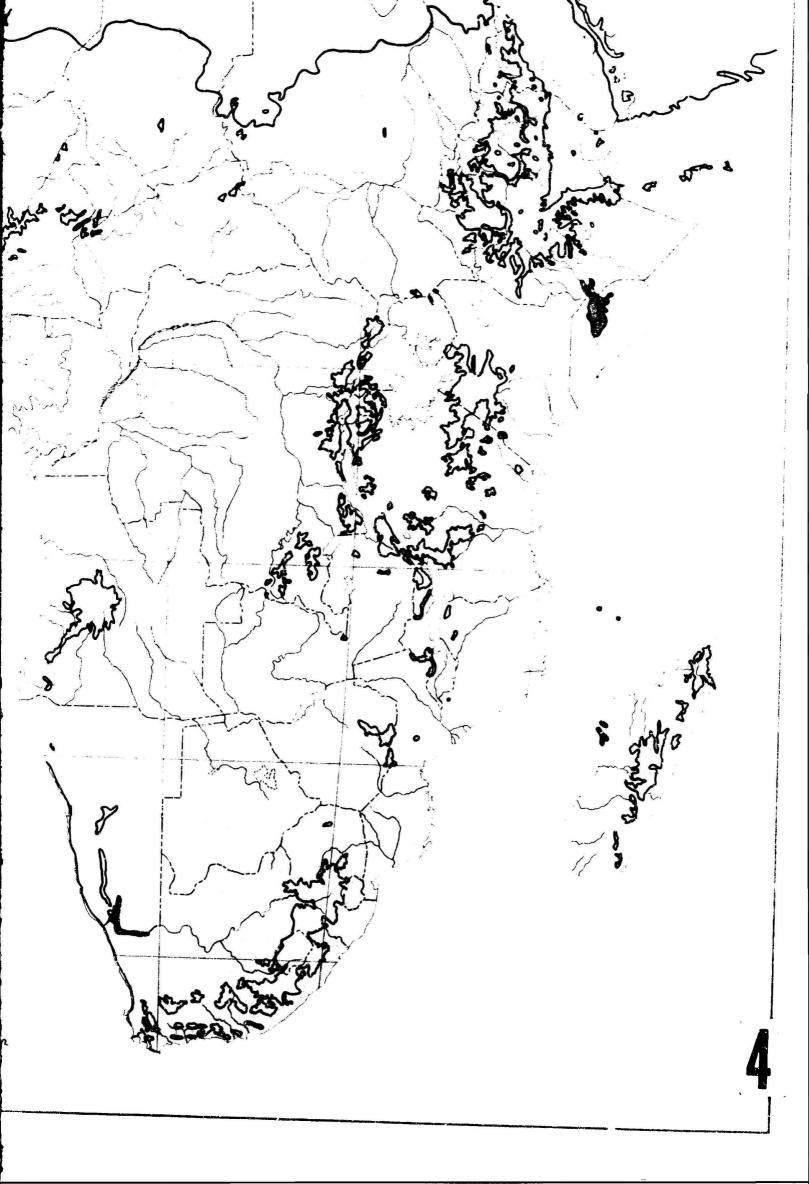


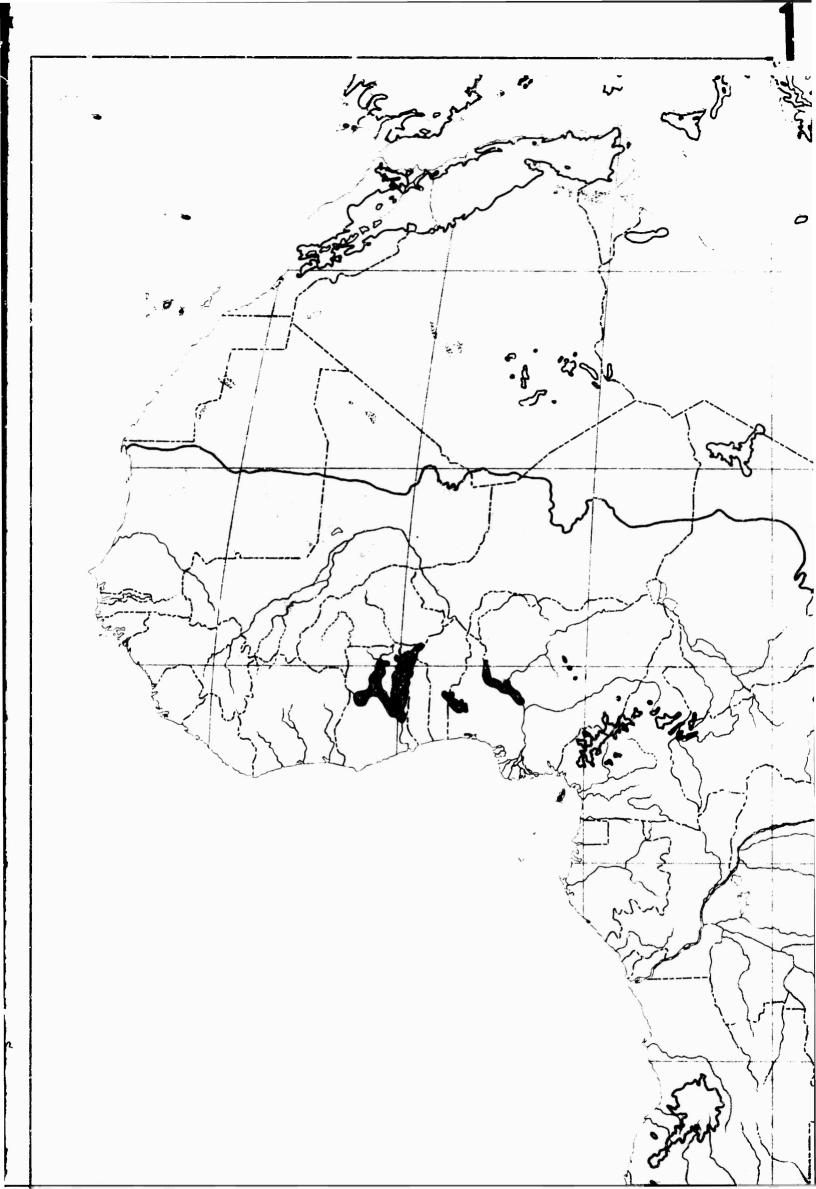


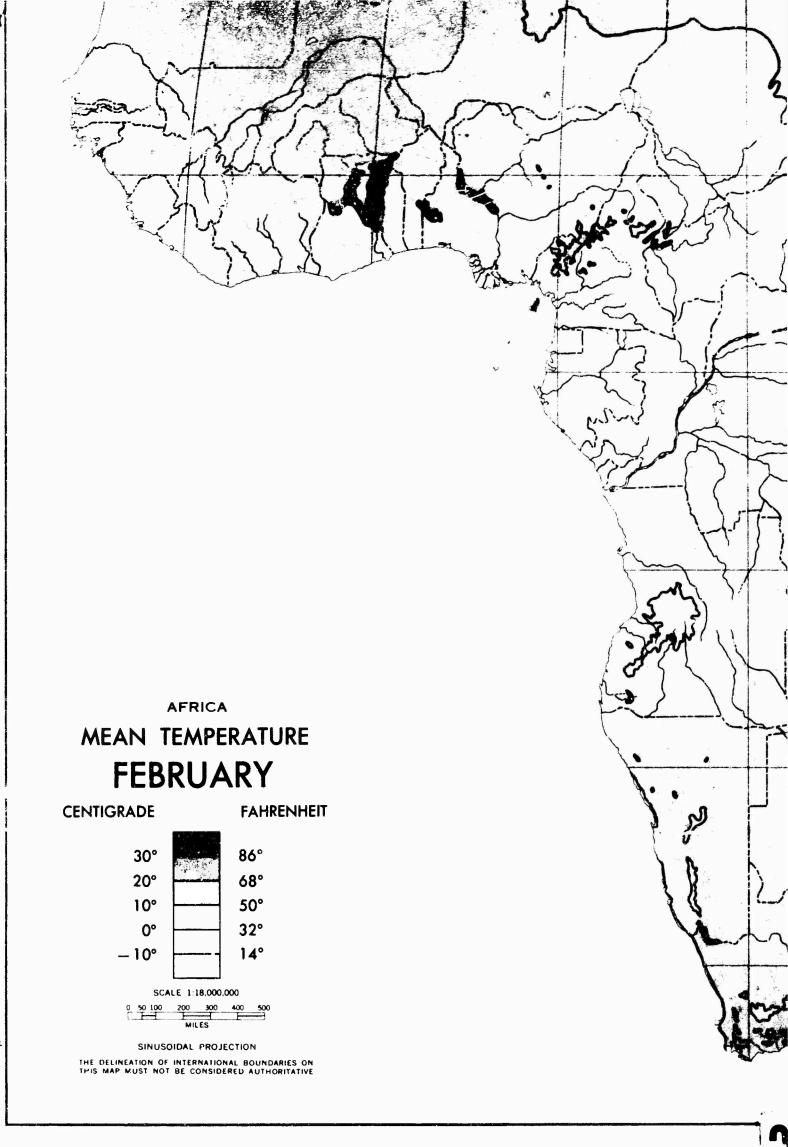


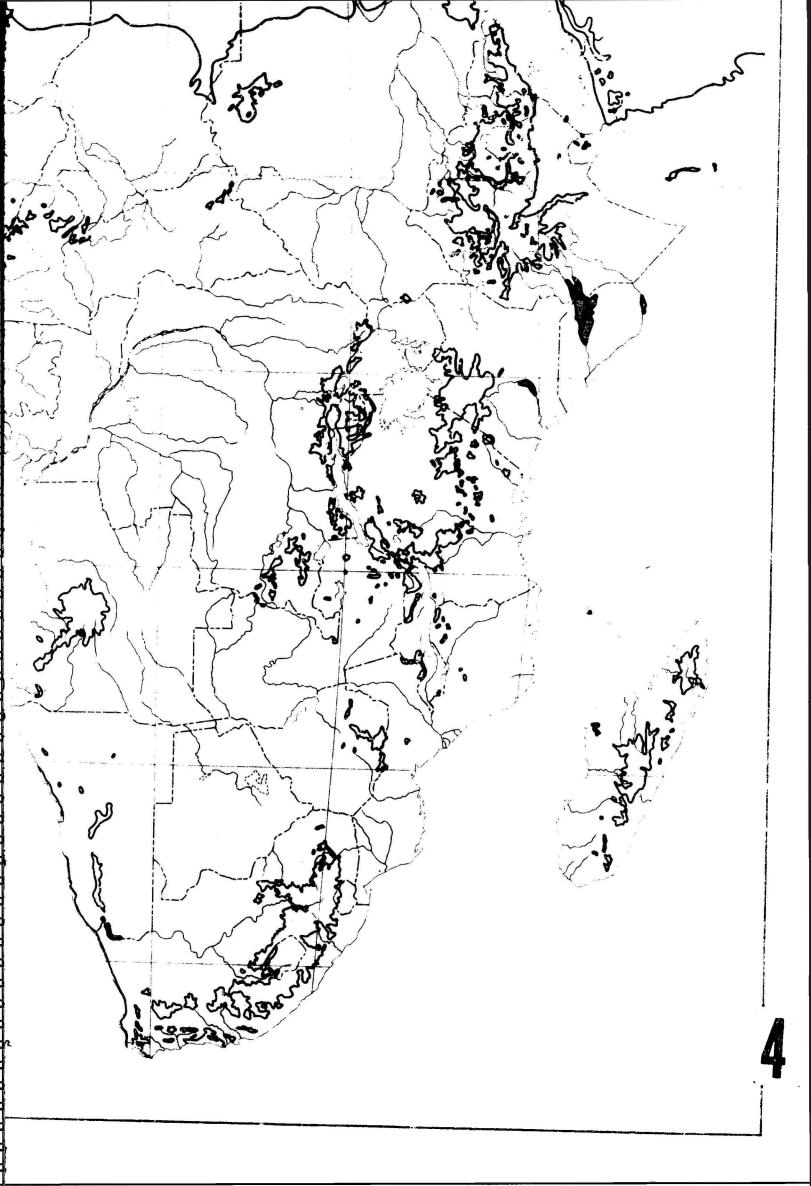


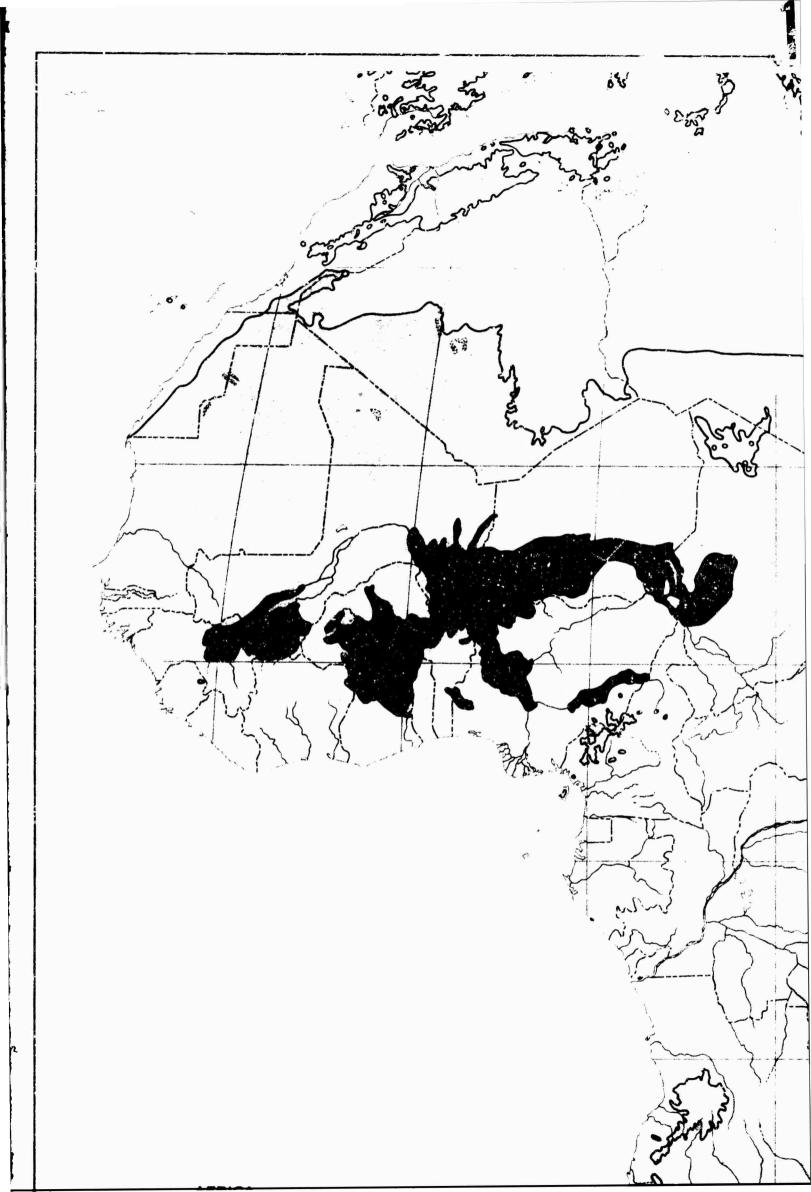


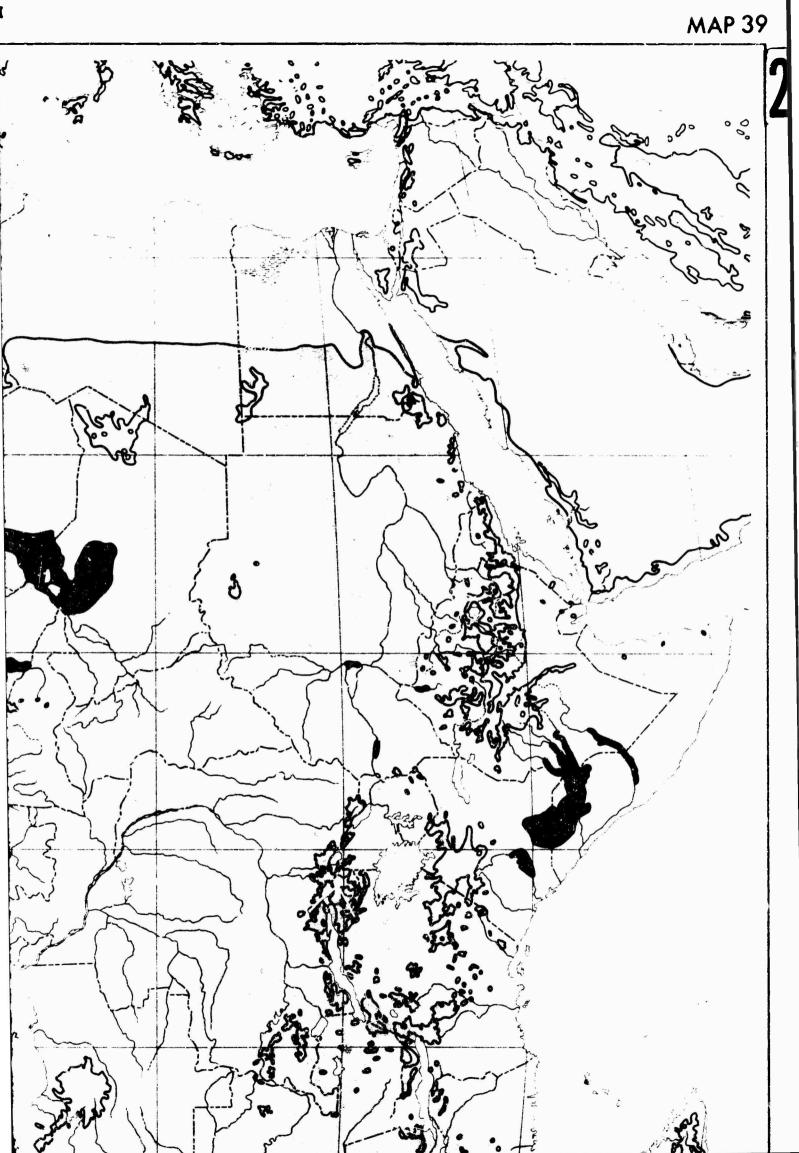


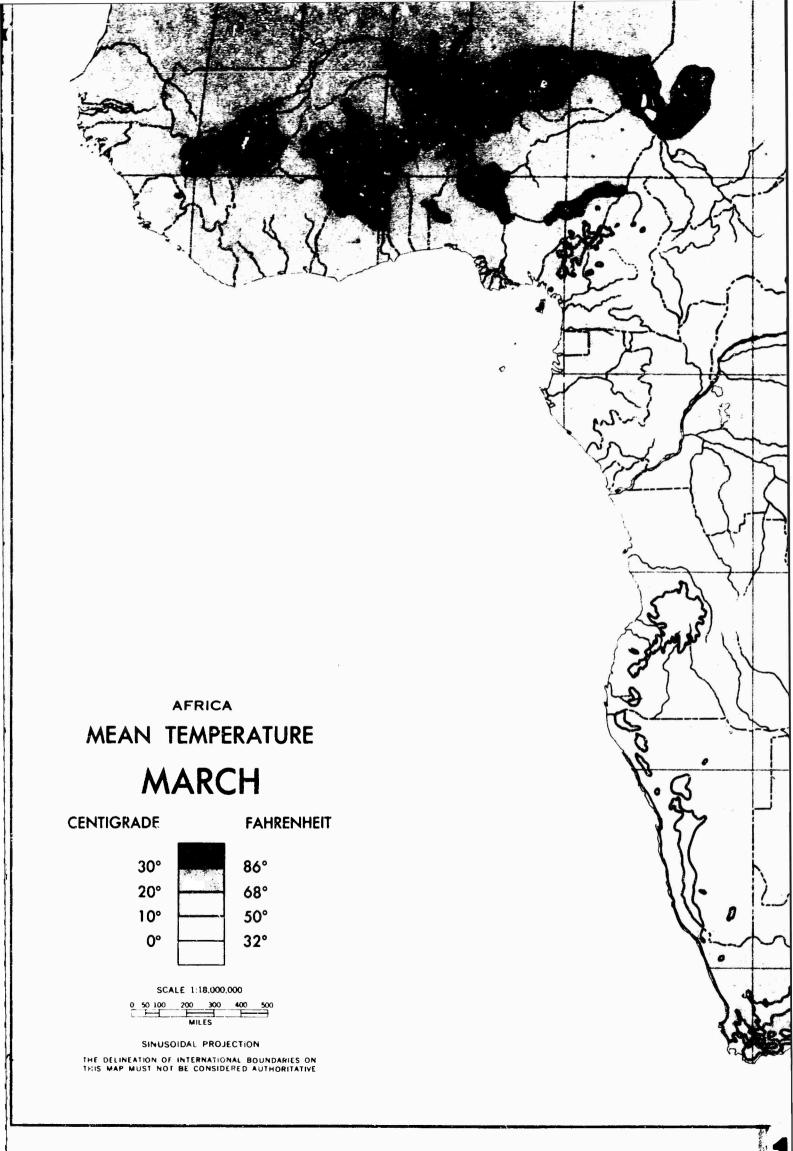


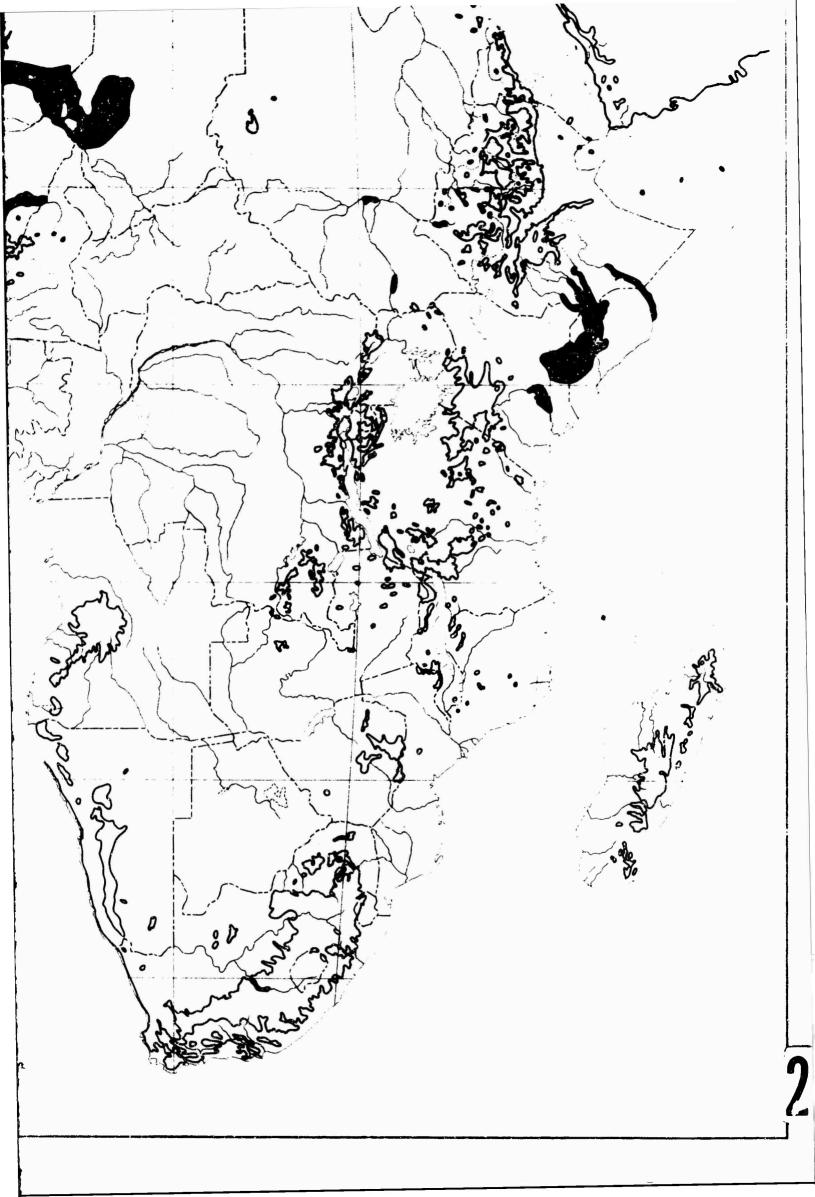


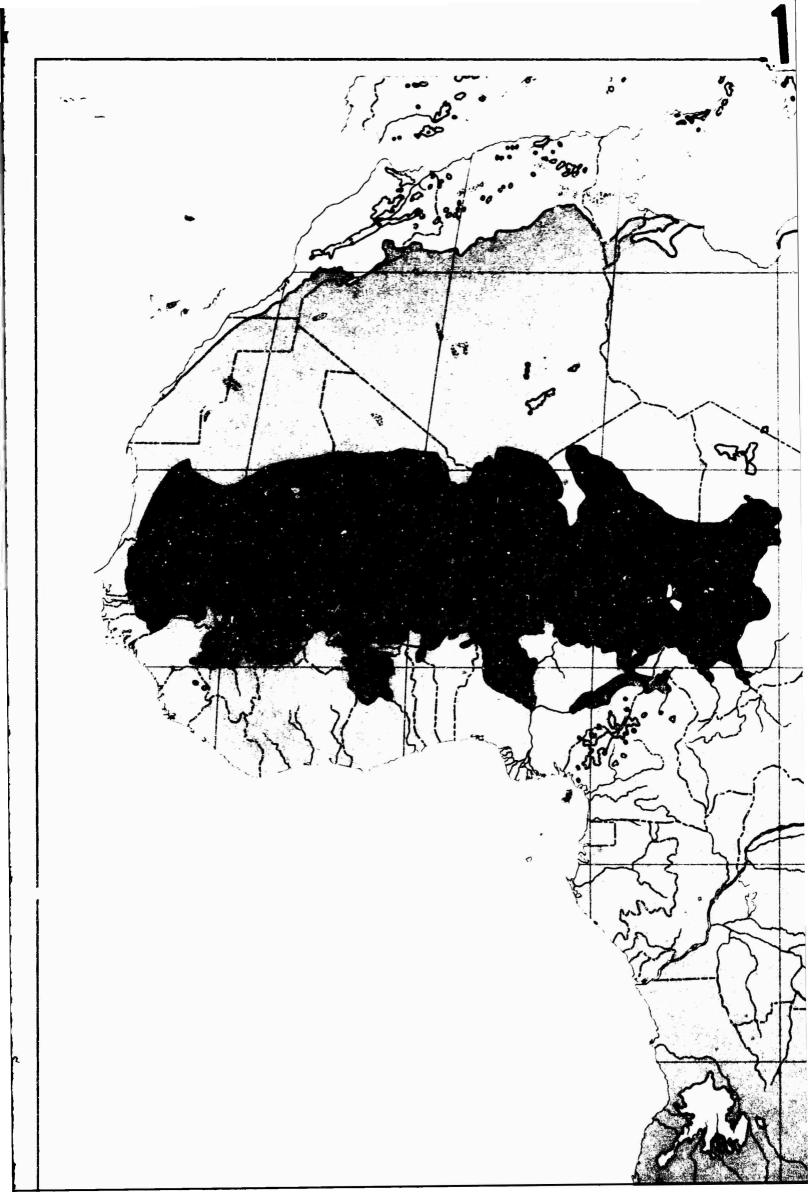


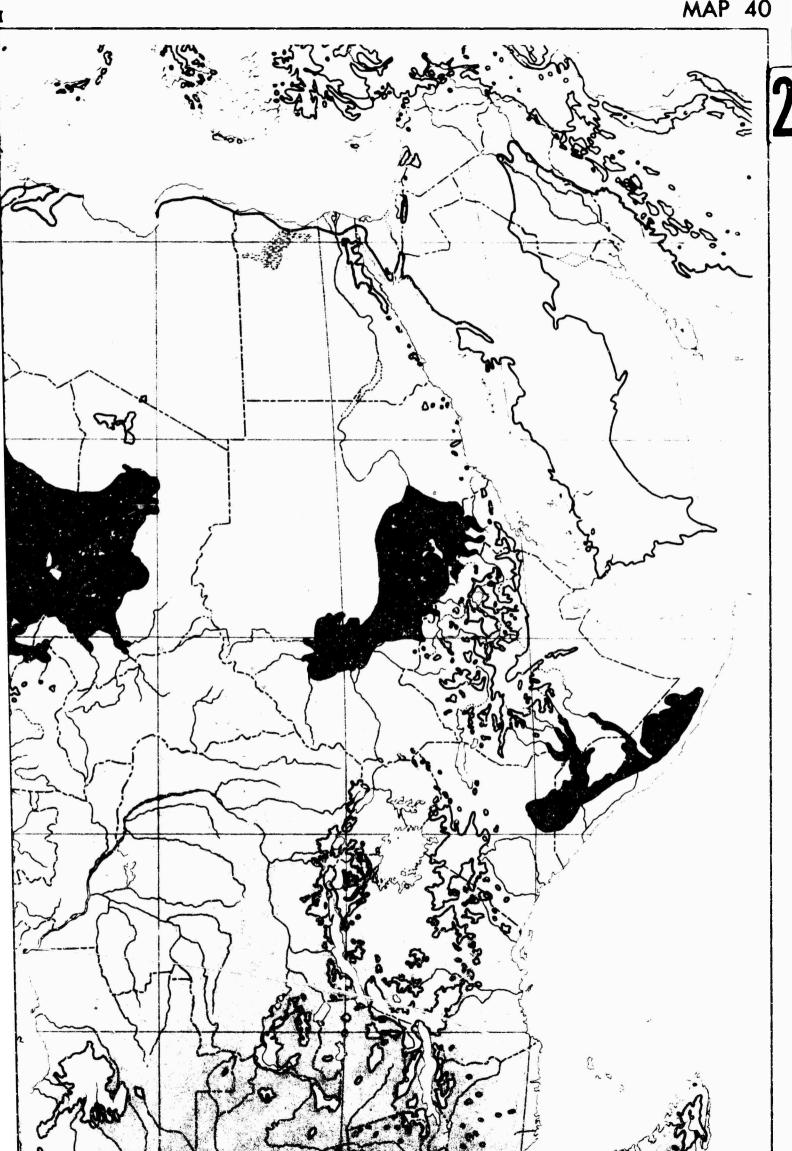


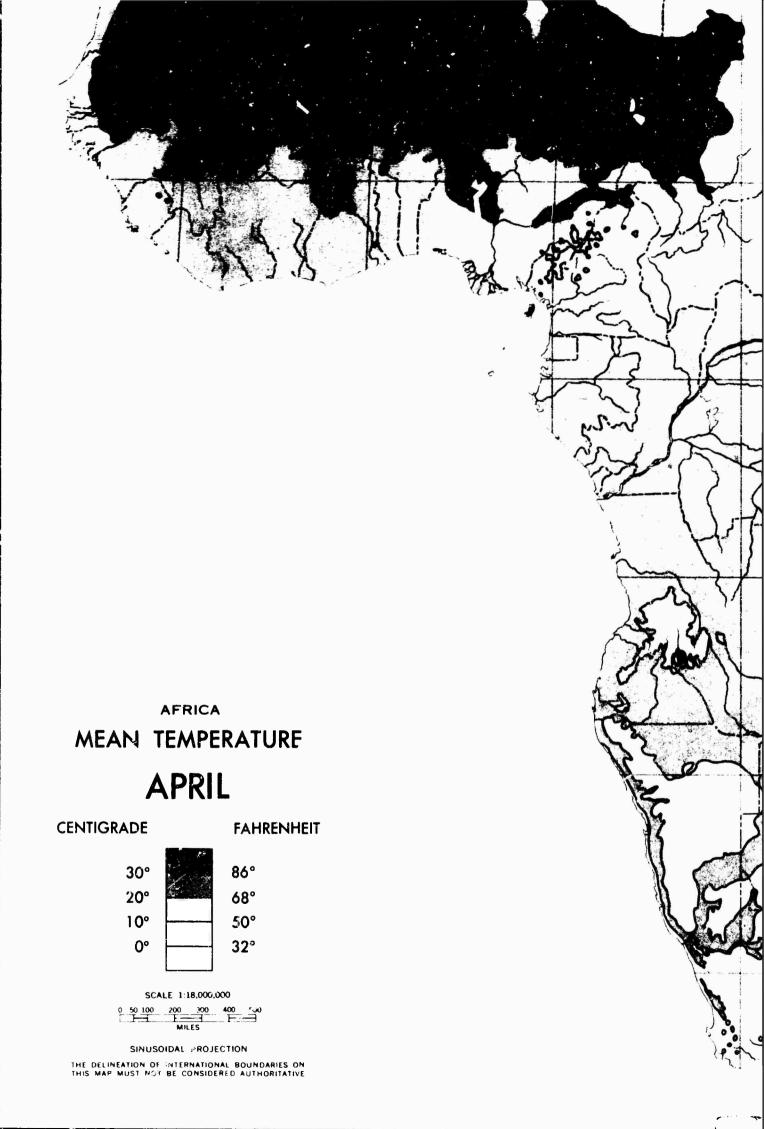


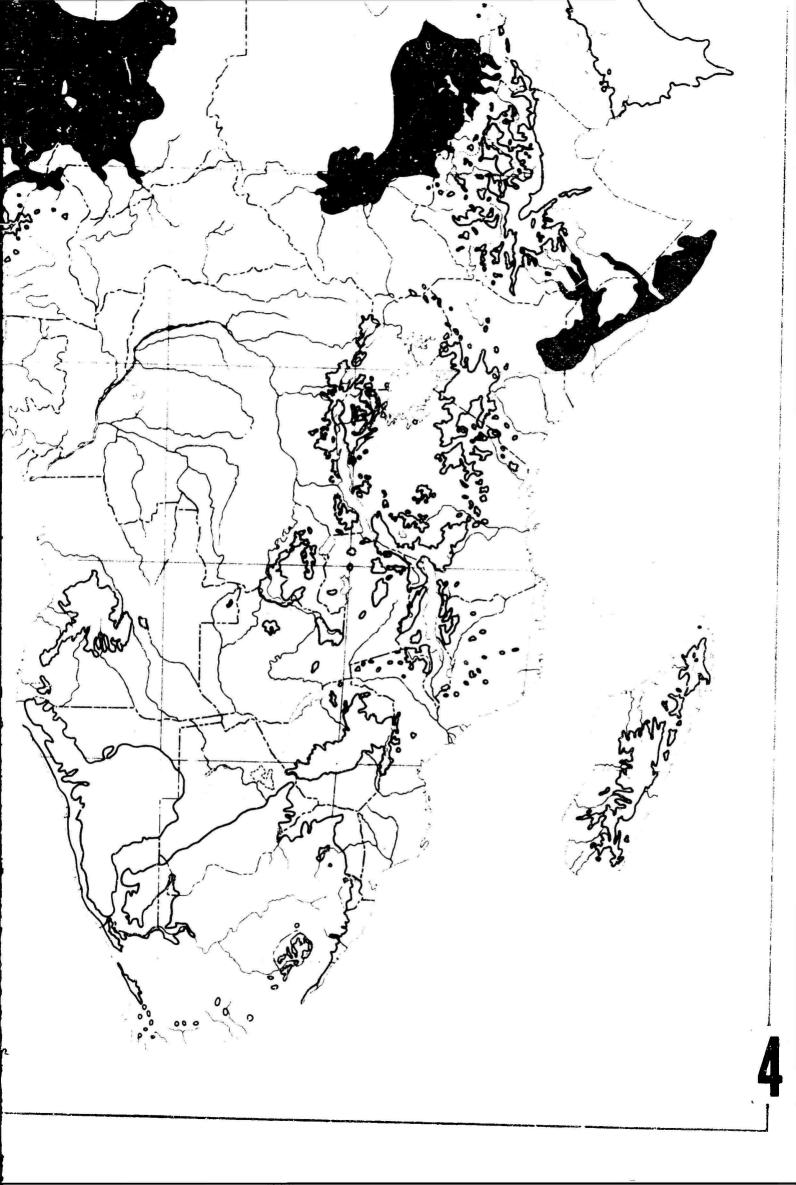


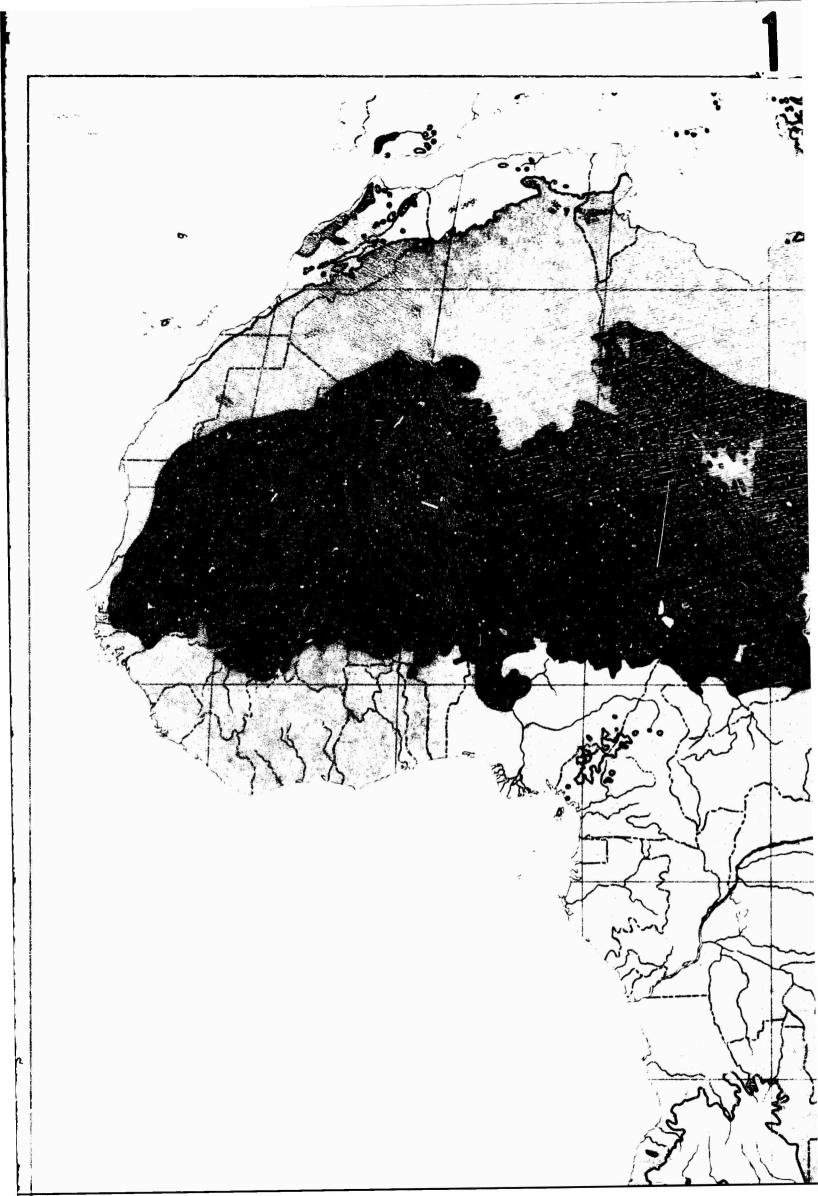


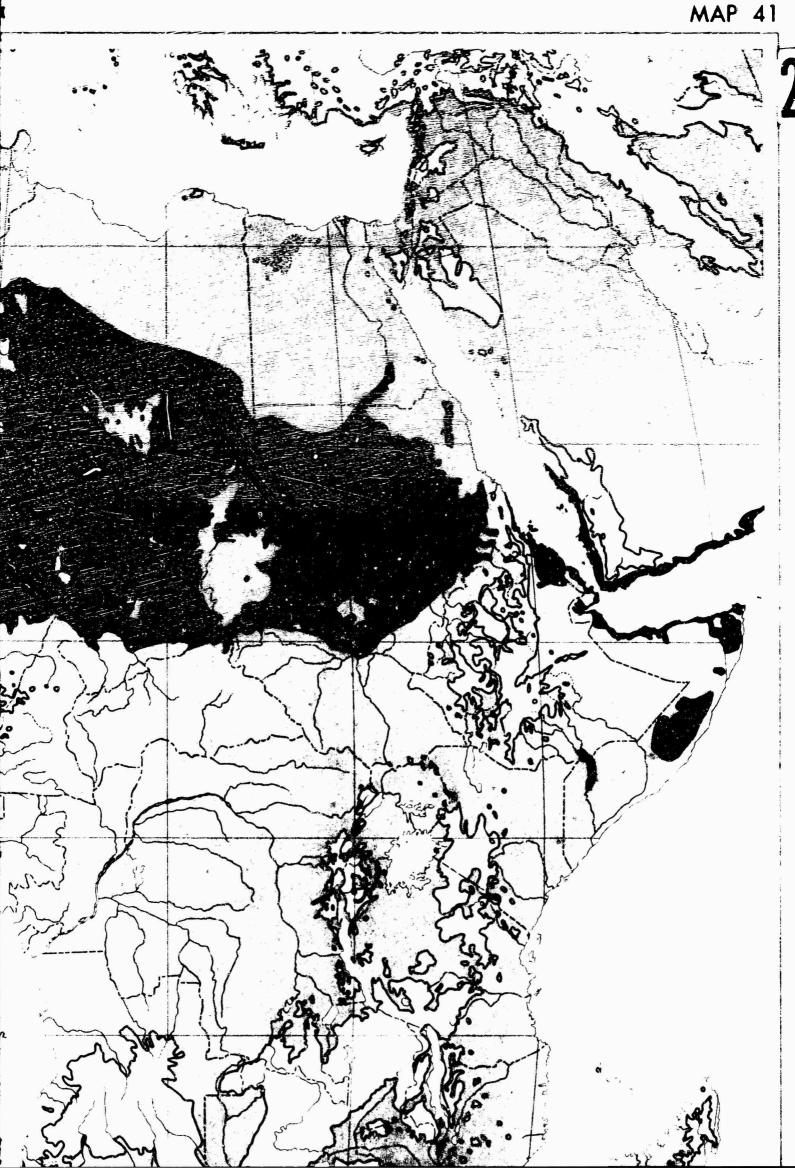


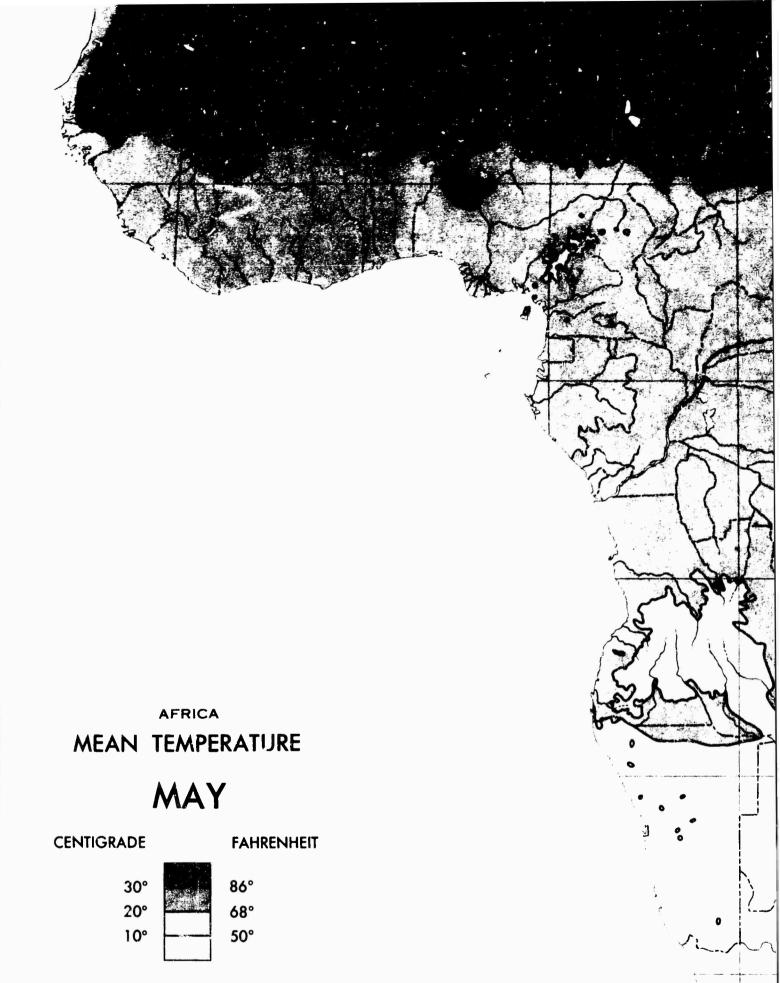










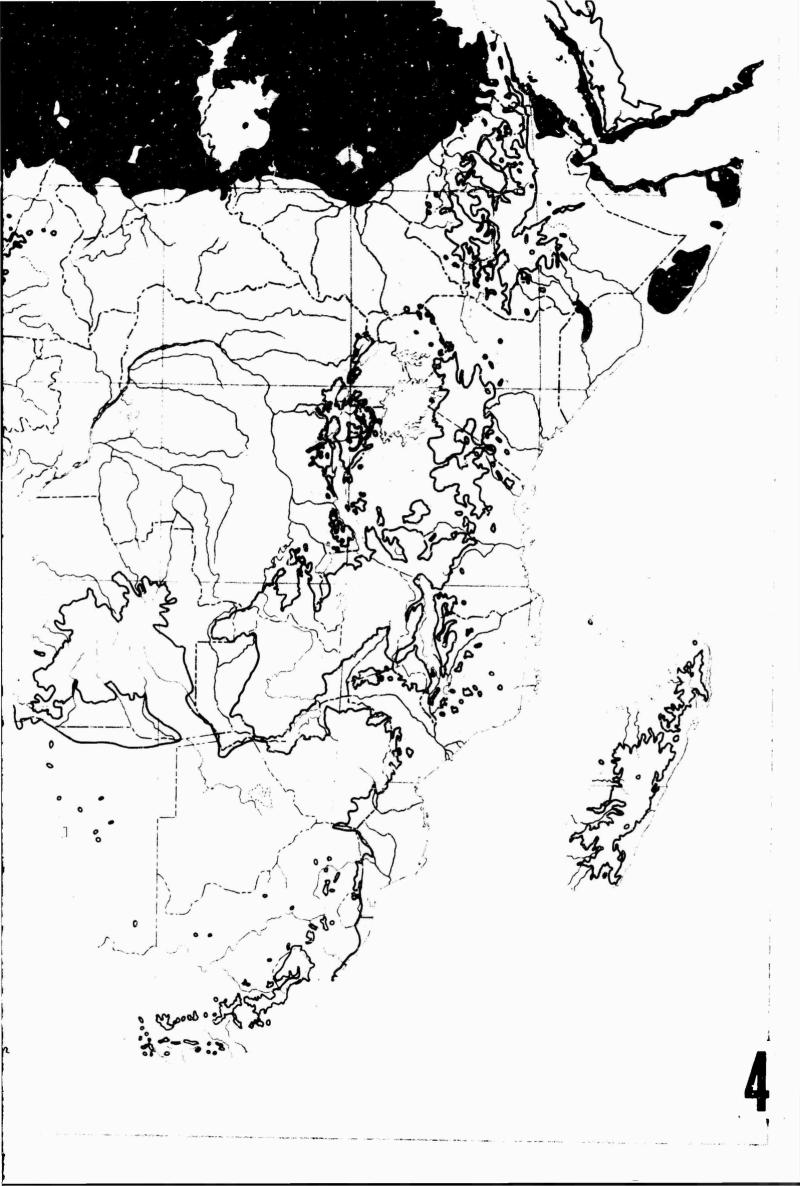


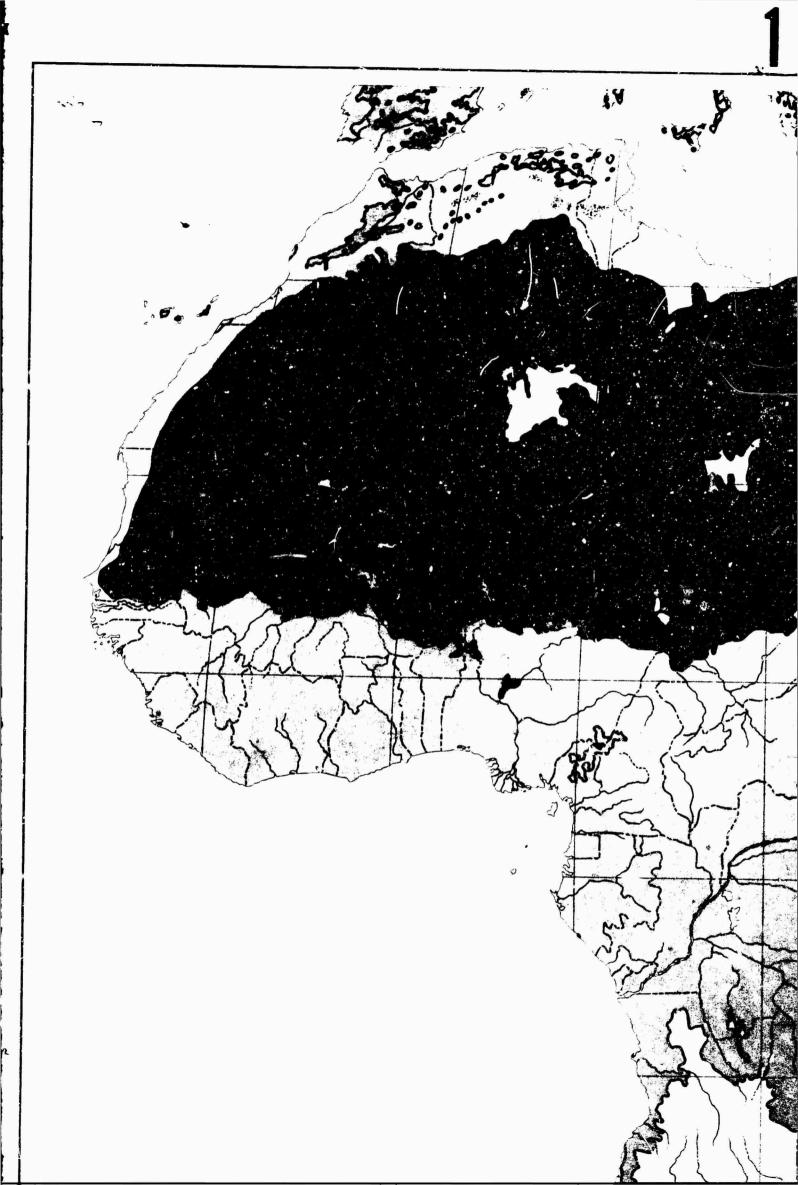
SCALE 1:18,000,000

0 50 100 200 300 400 500 MILES

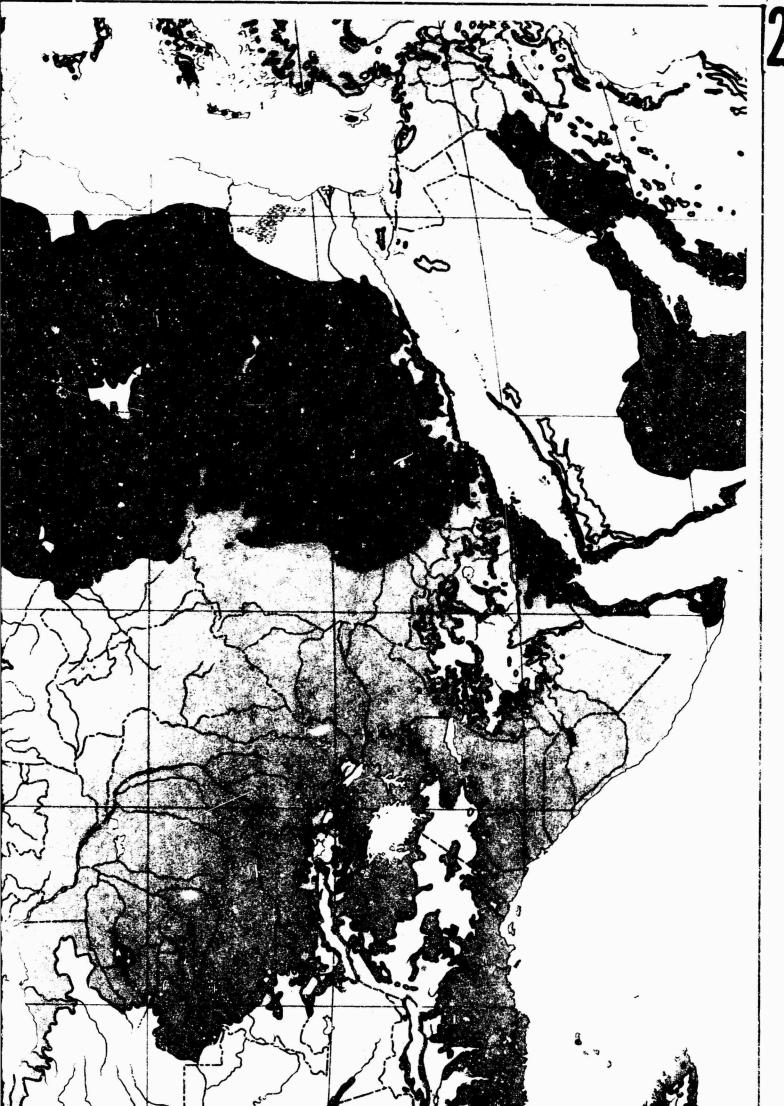
SINUSOIDAL PROJECTION

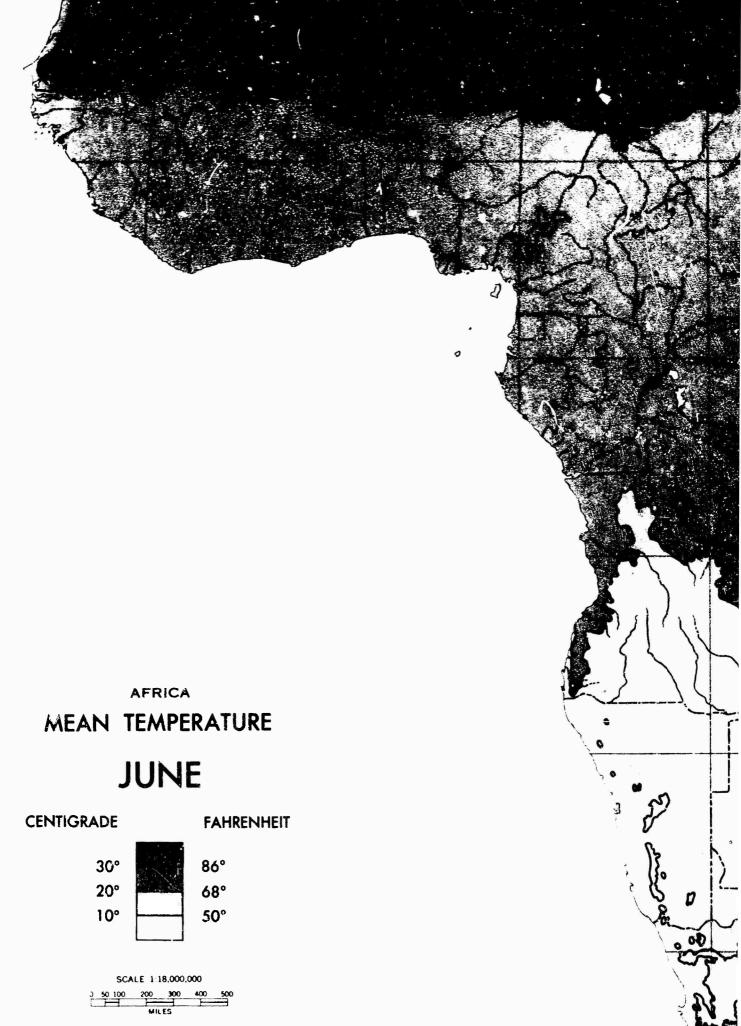
THE DELINEATION OF INTERNATIONAL BOUNDARIES ON THIS MAP MUST N IT BE CONSIDERED AUTHORITATIVE





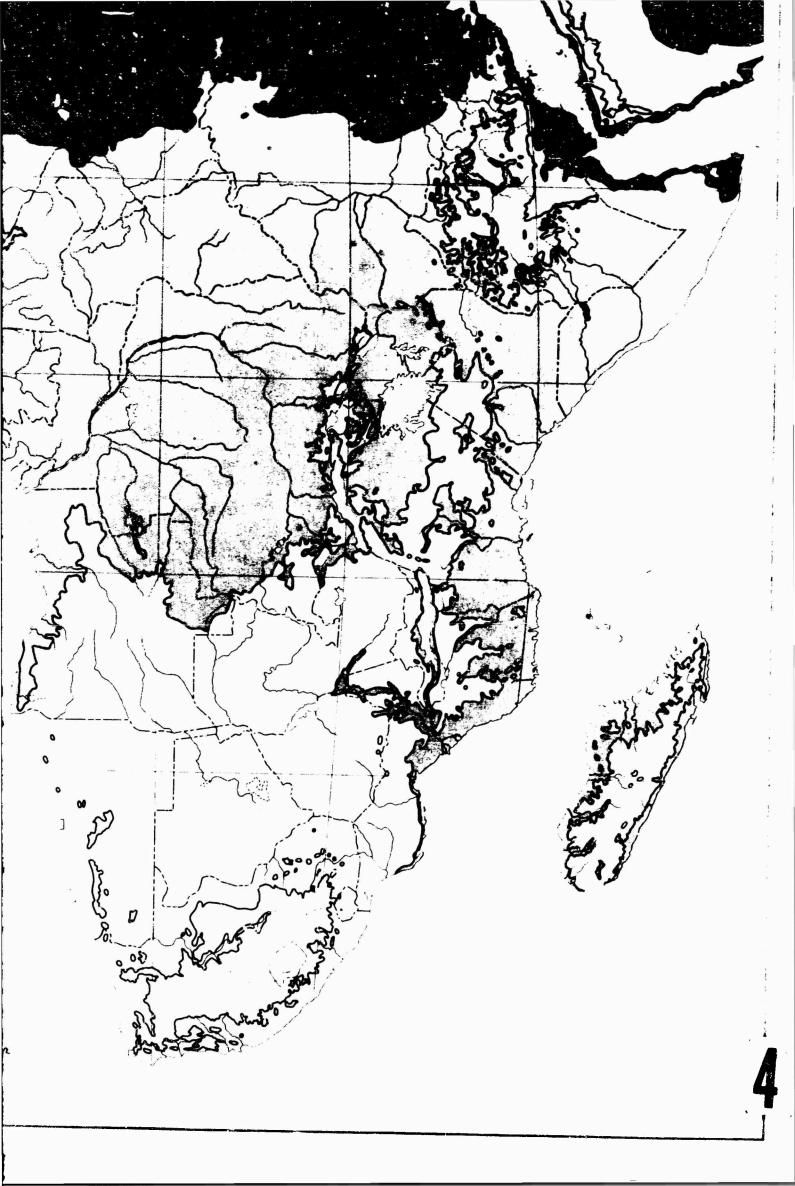


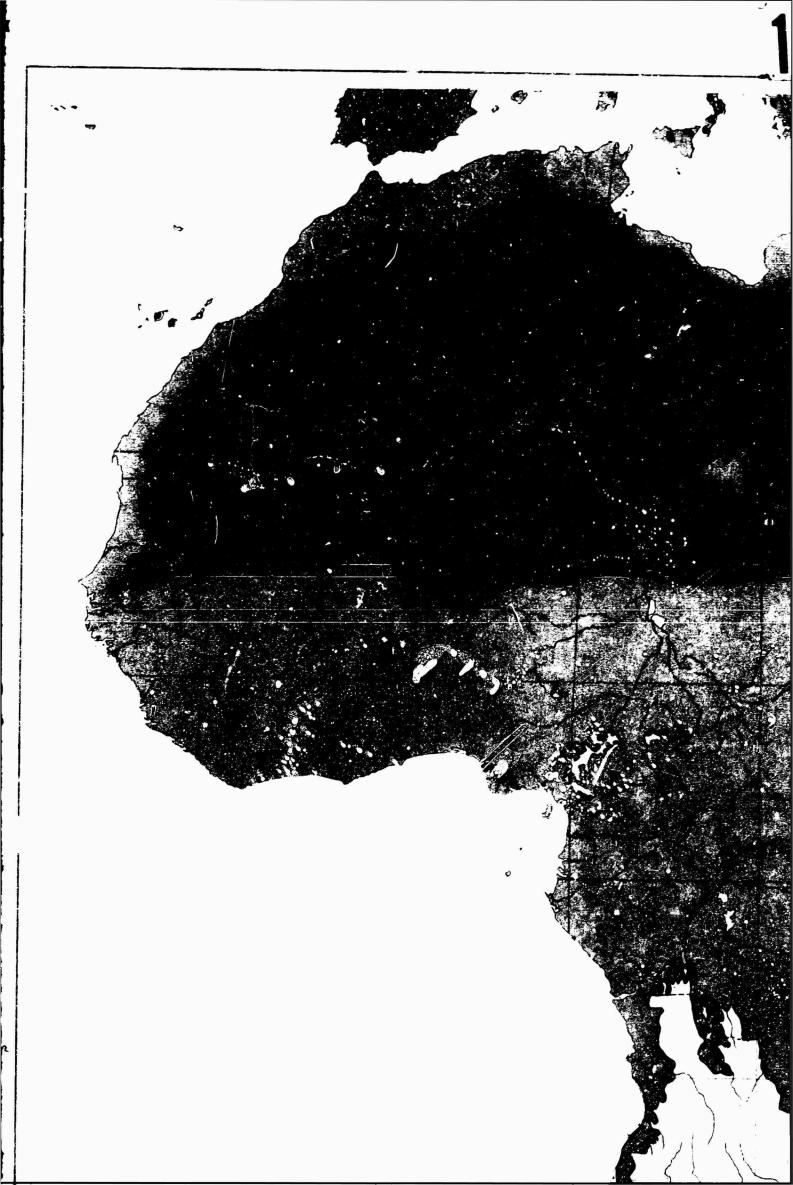


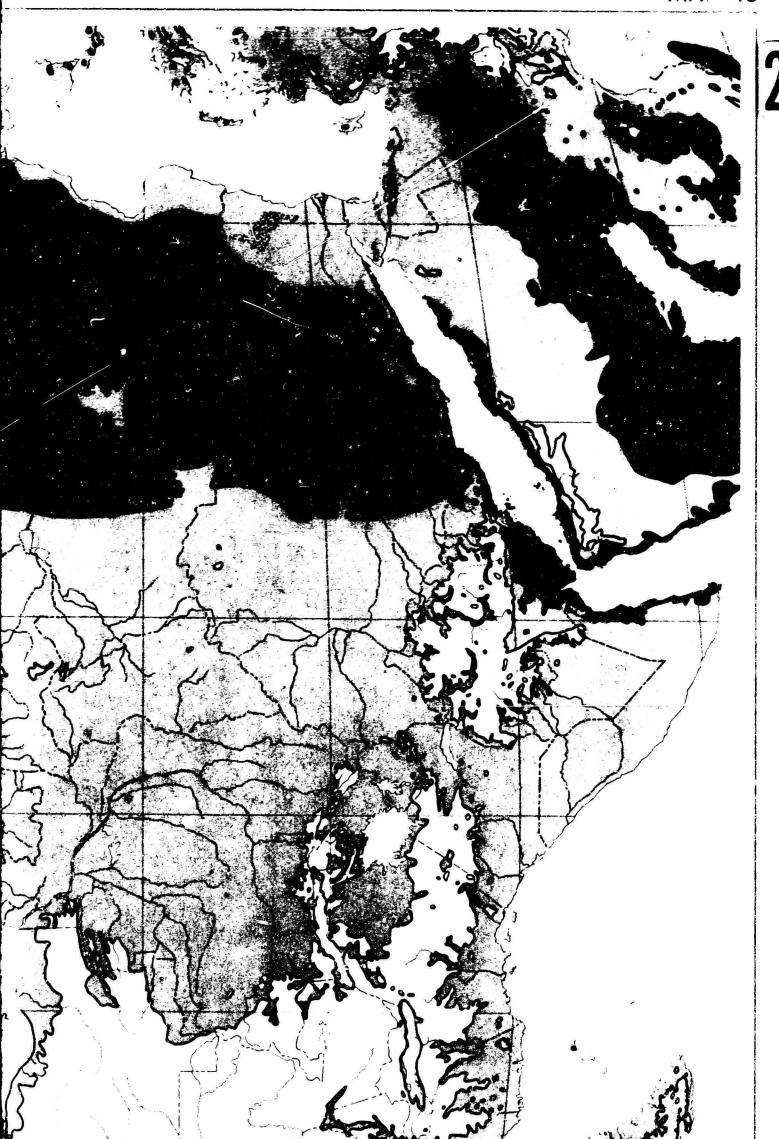


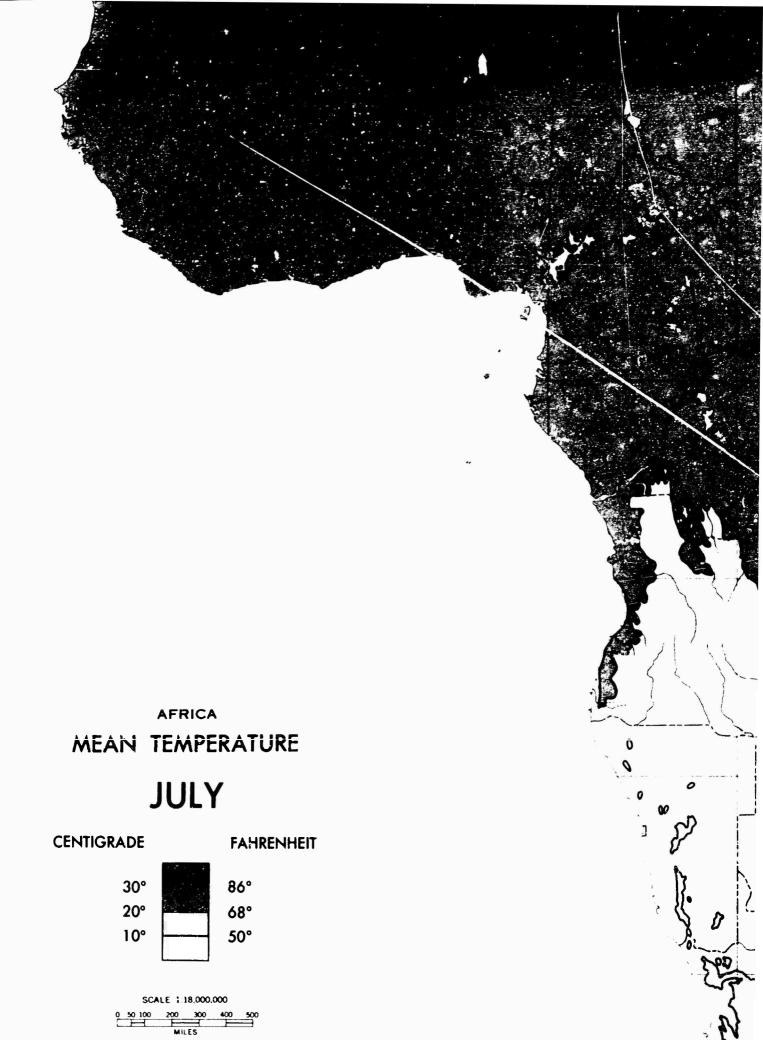
SINUSOIDAL PROJECTION

THE DELINEATION OF INTERNATIONAL BOUNDARIES ON THIS MAP MUST NOT BE CONSIDERED AUTHORITATIVE



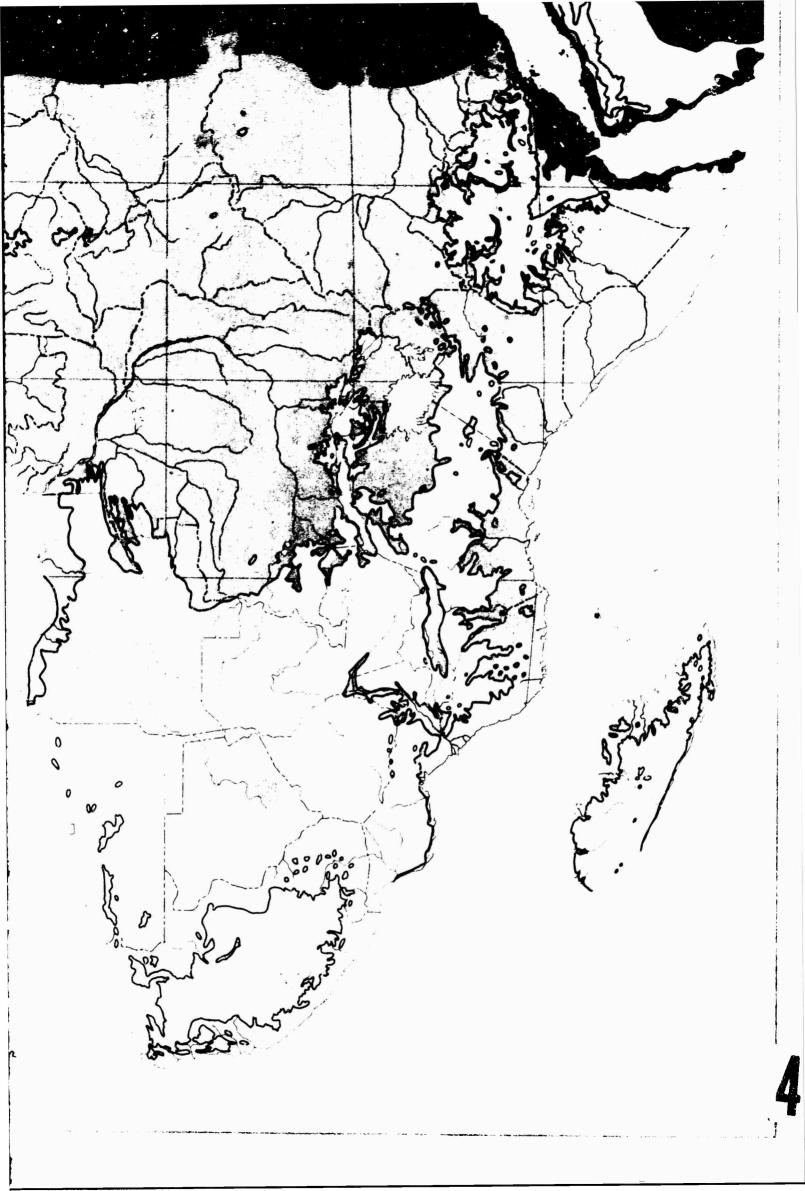


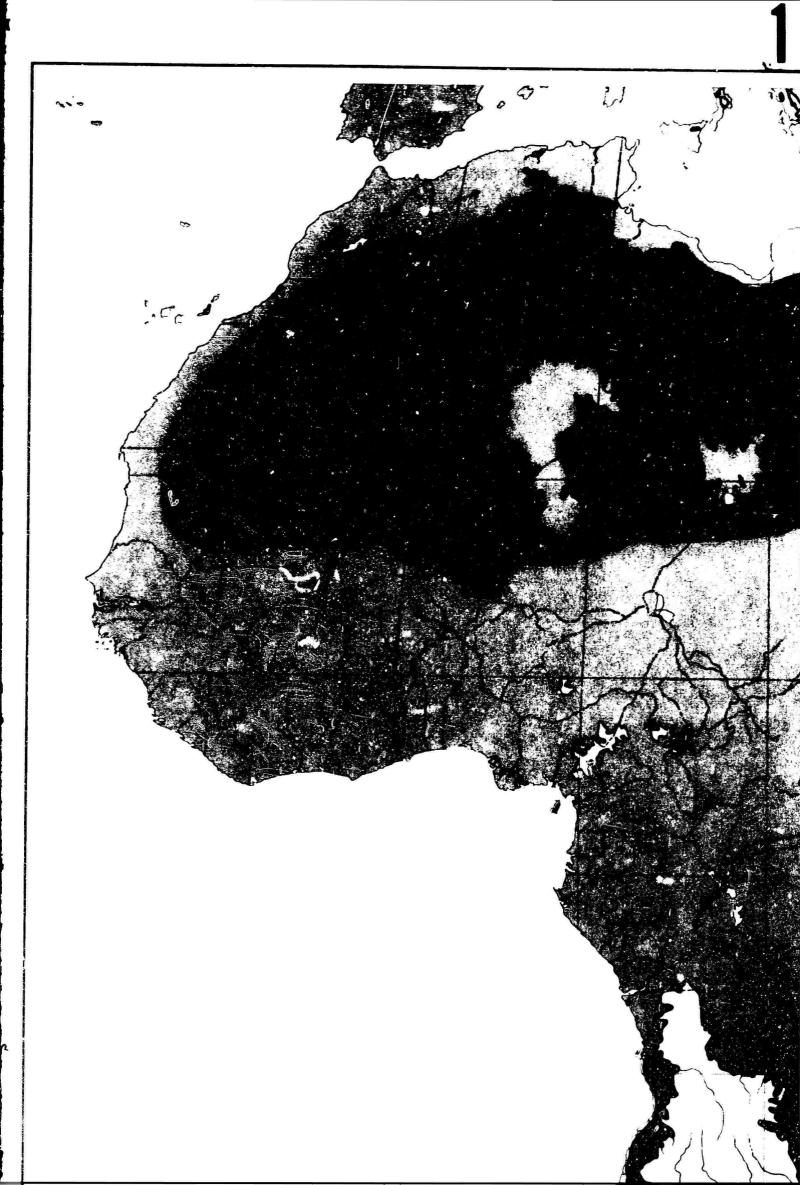


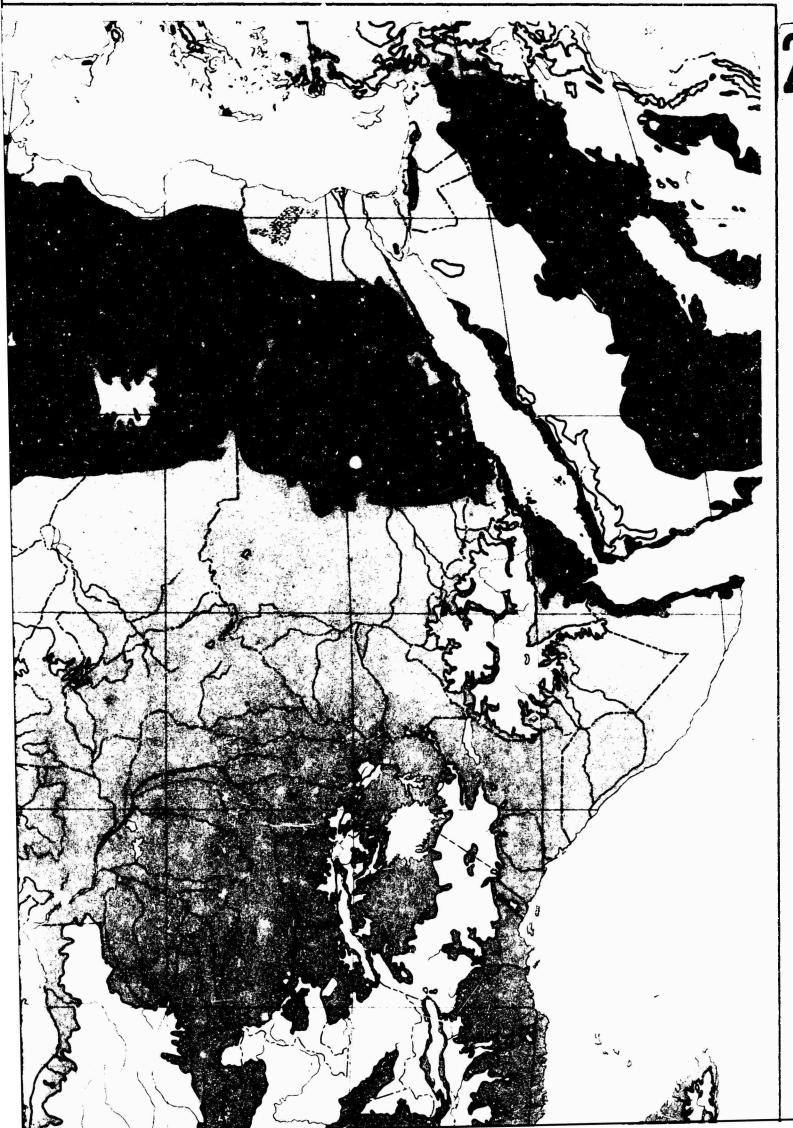


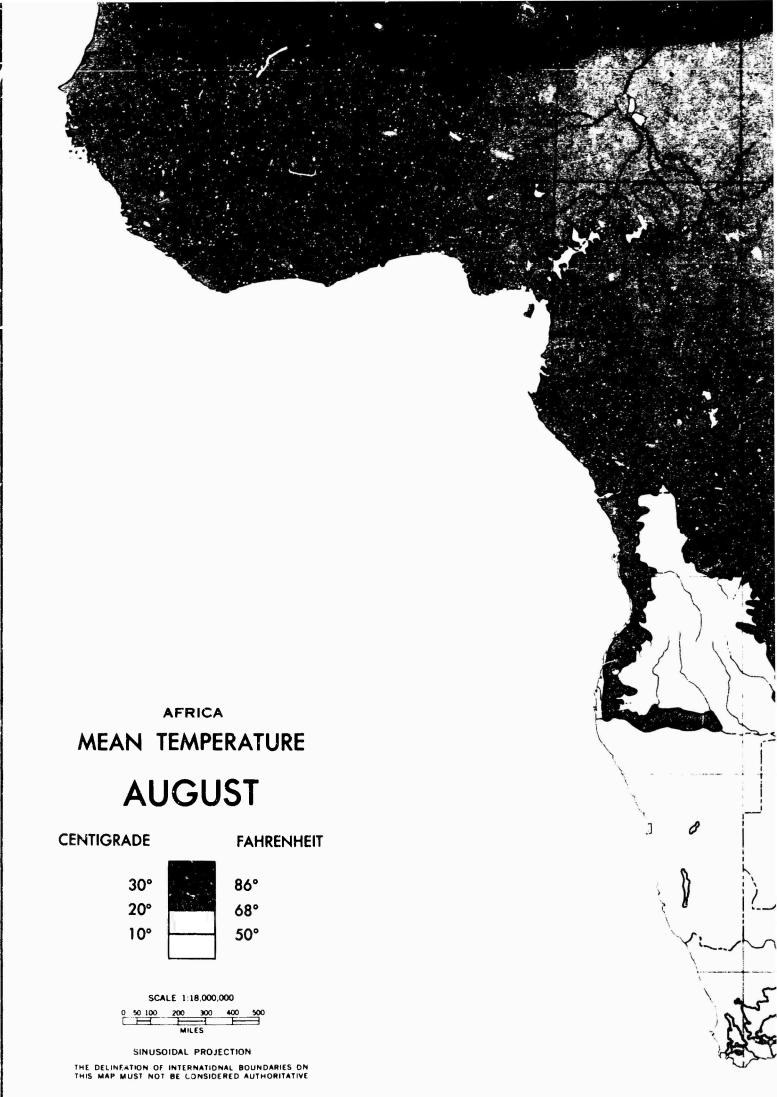
SINUSOIDAL PROJECTION

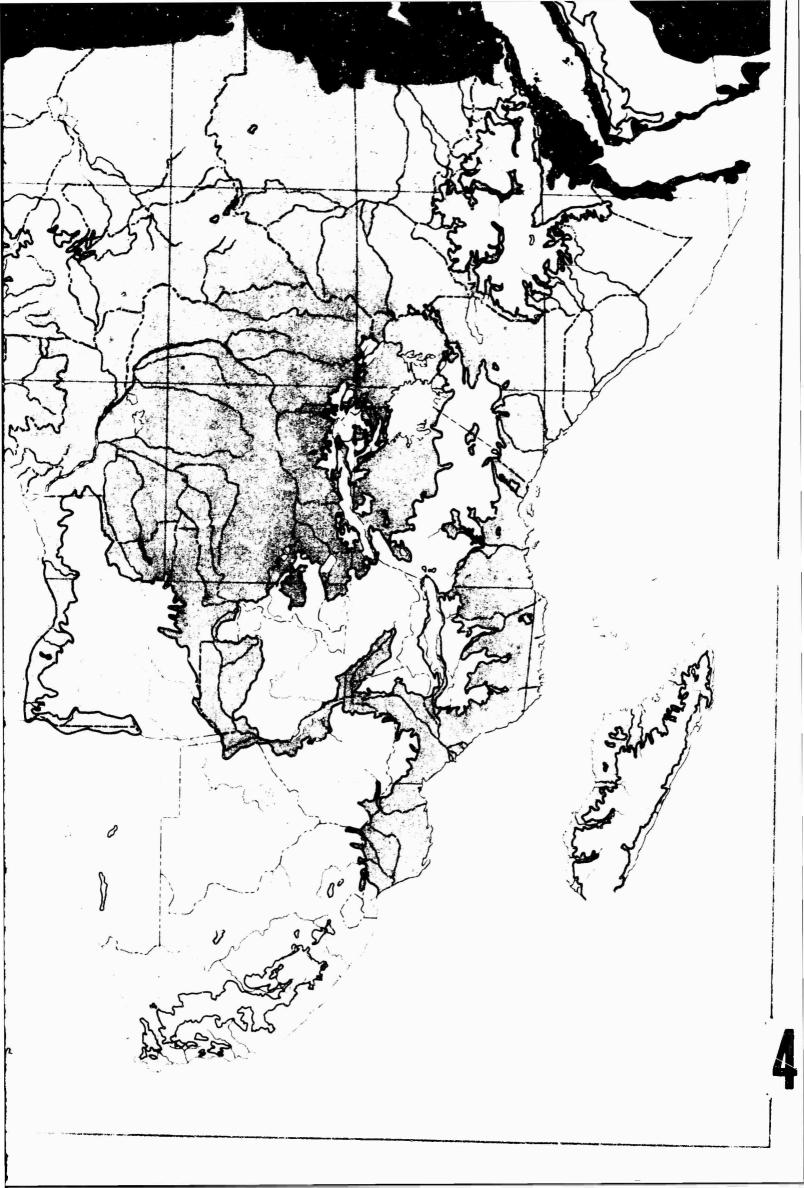
THE DELINEATION OF INTERNATIONAL BOUNDARIES ON THIS MAP MUST NOT BE CONSIDERED AUTHORITATIVE

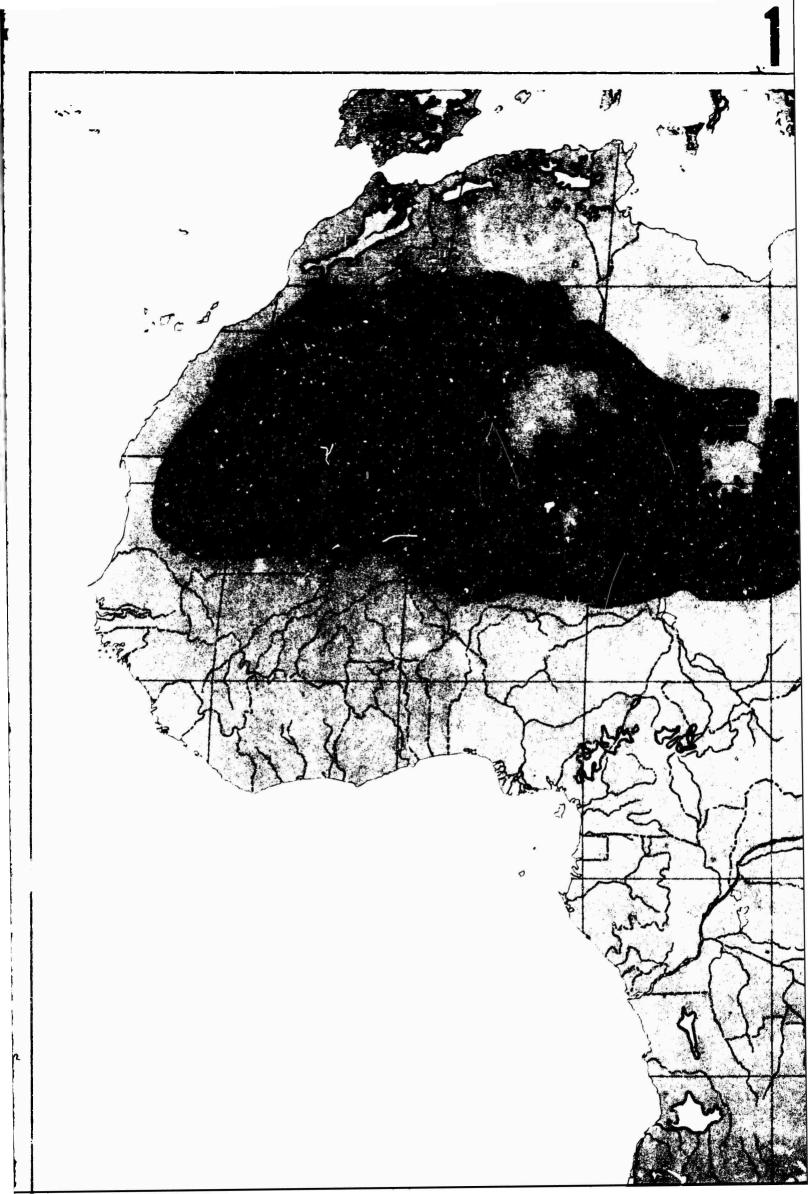


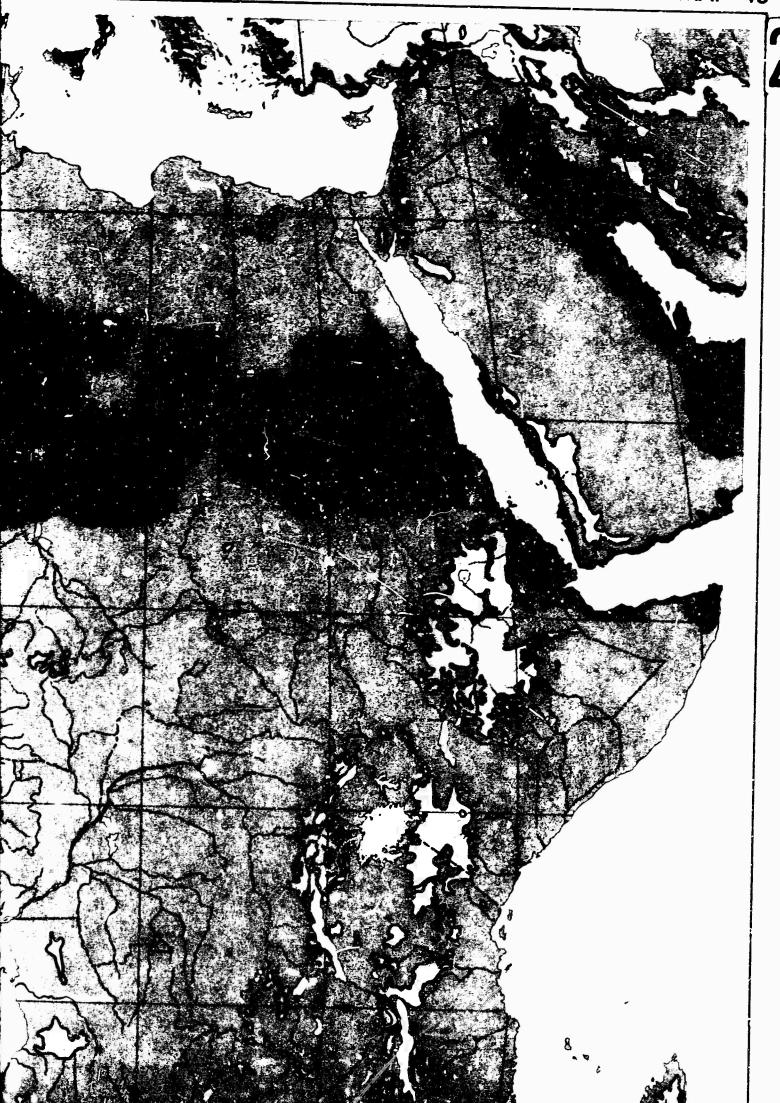


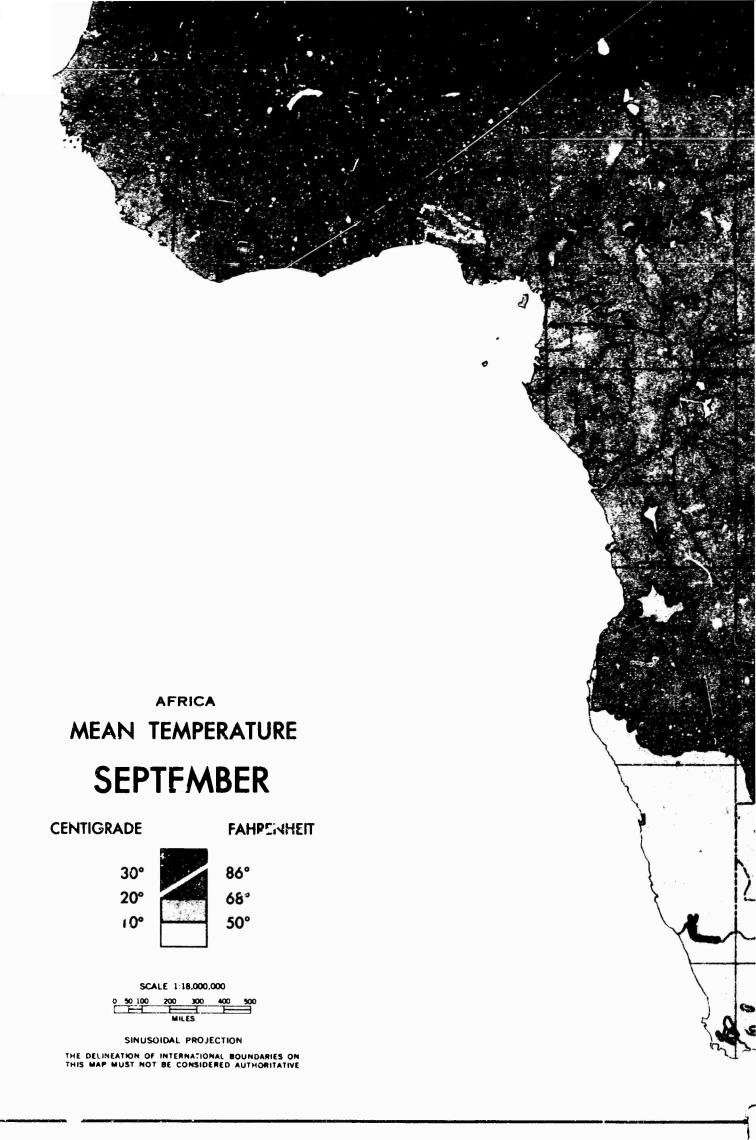


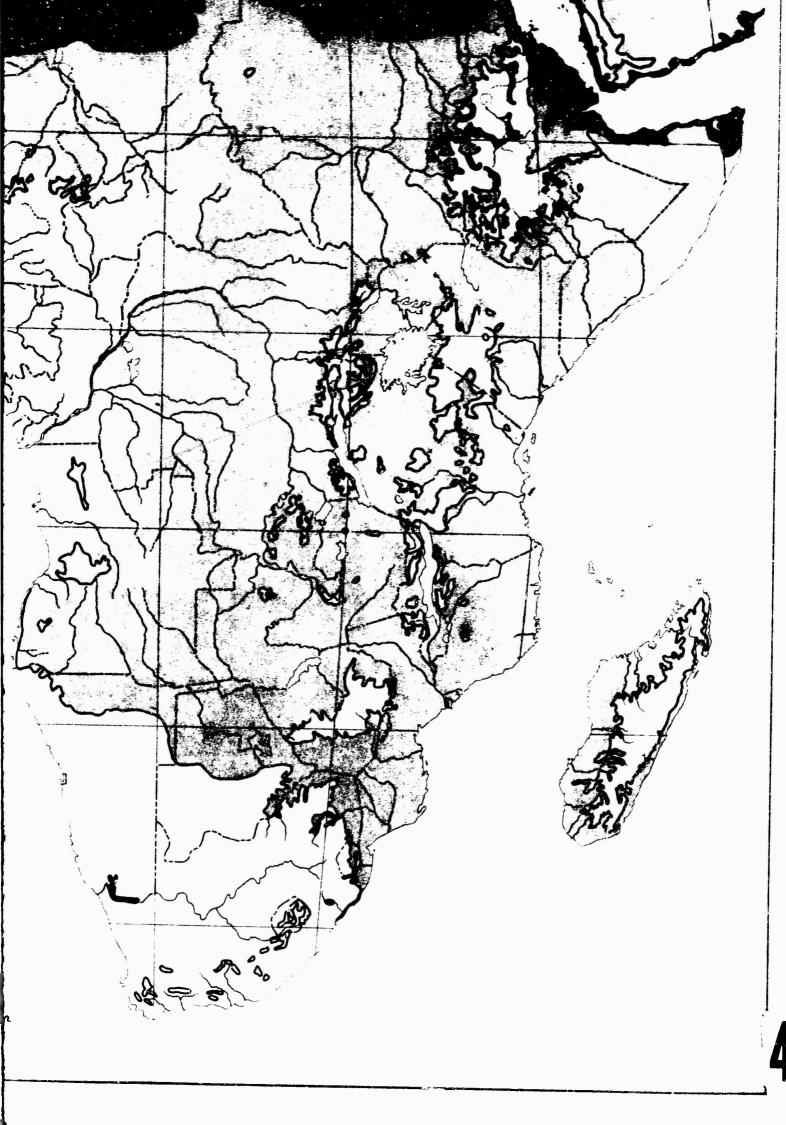


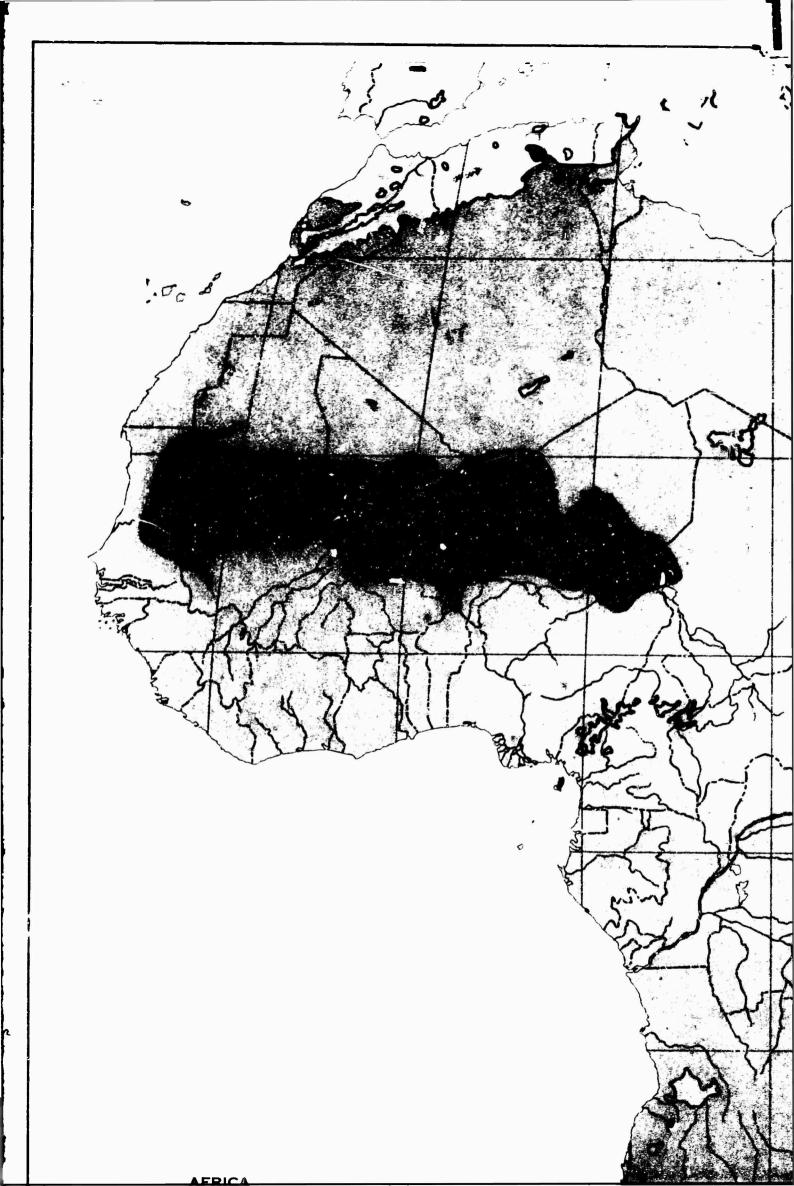


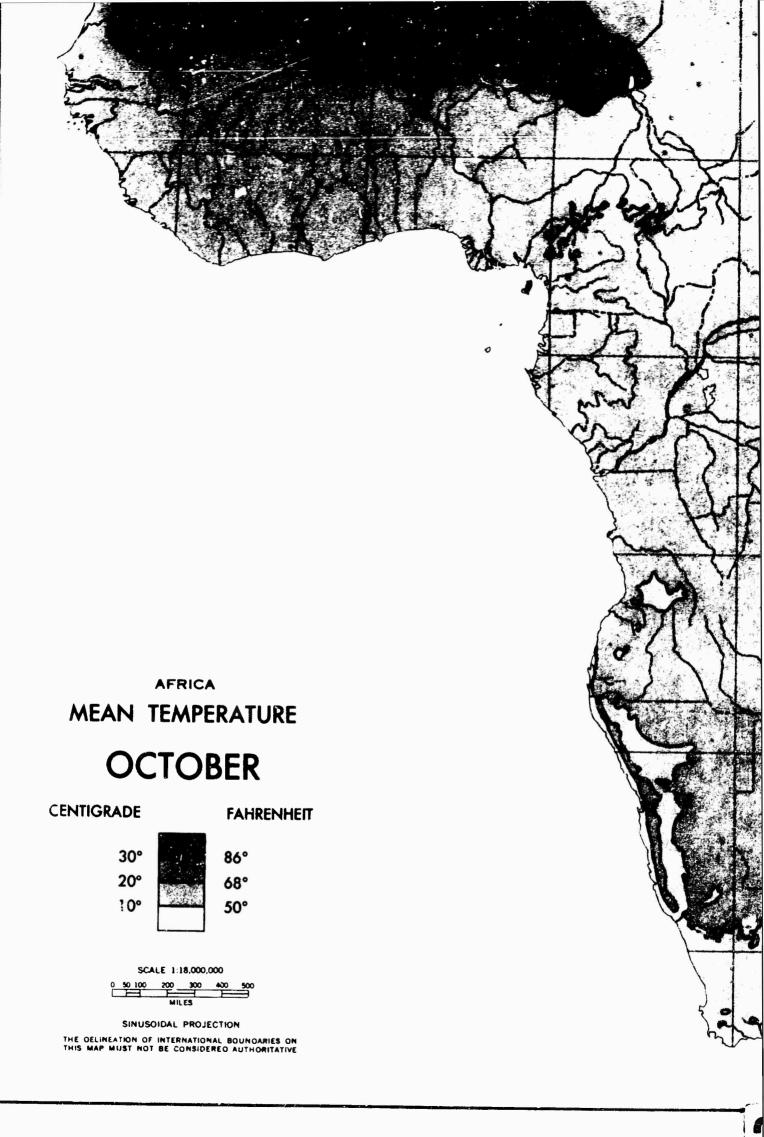


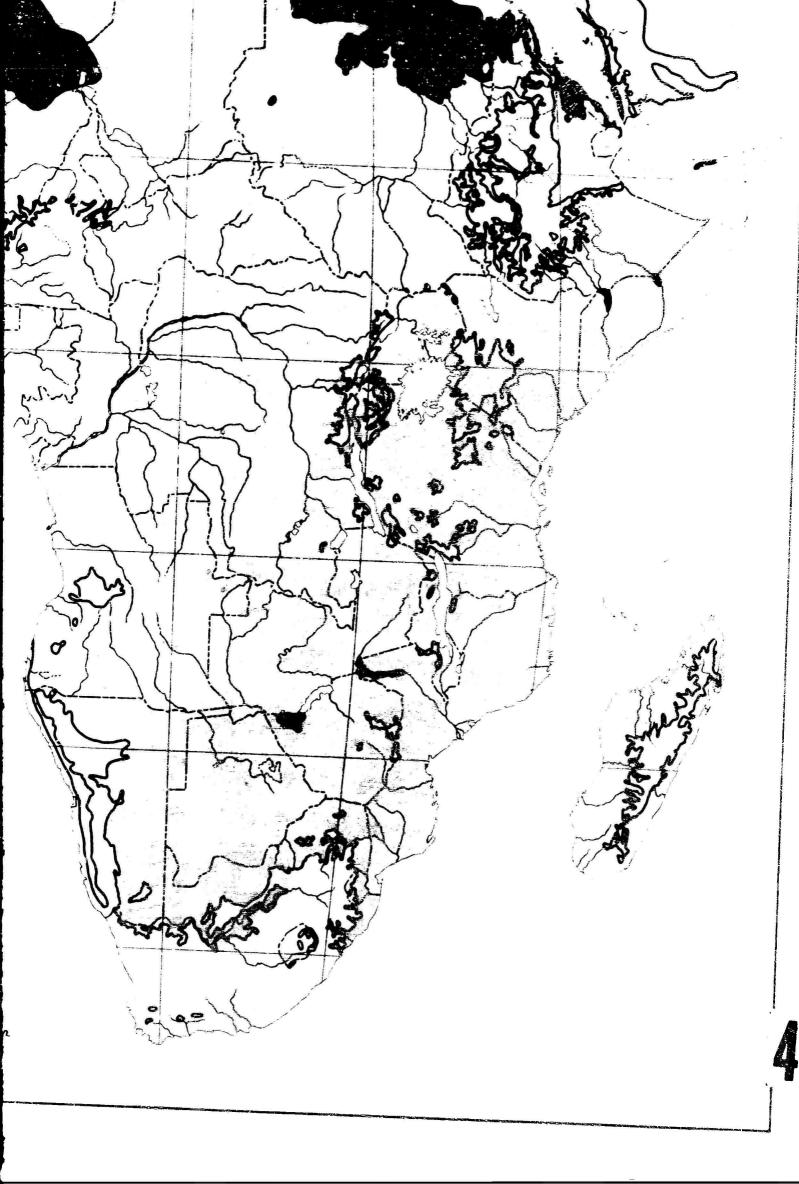


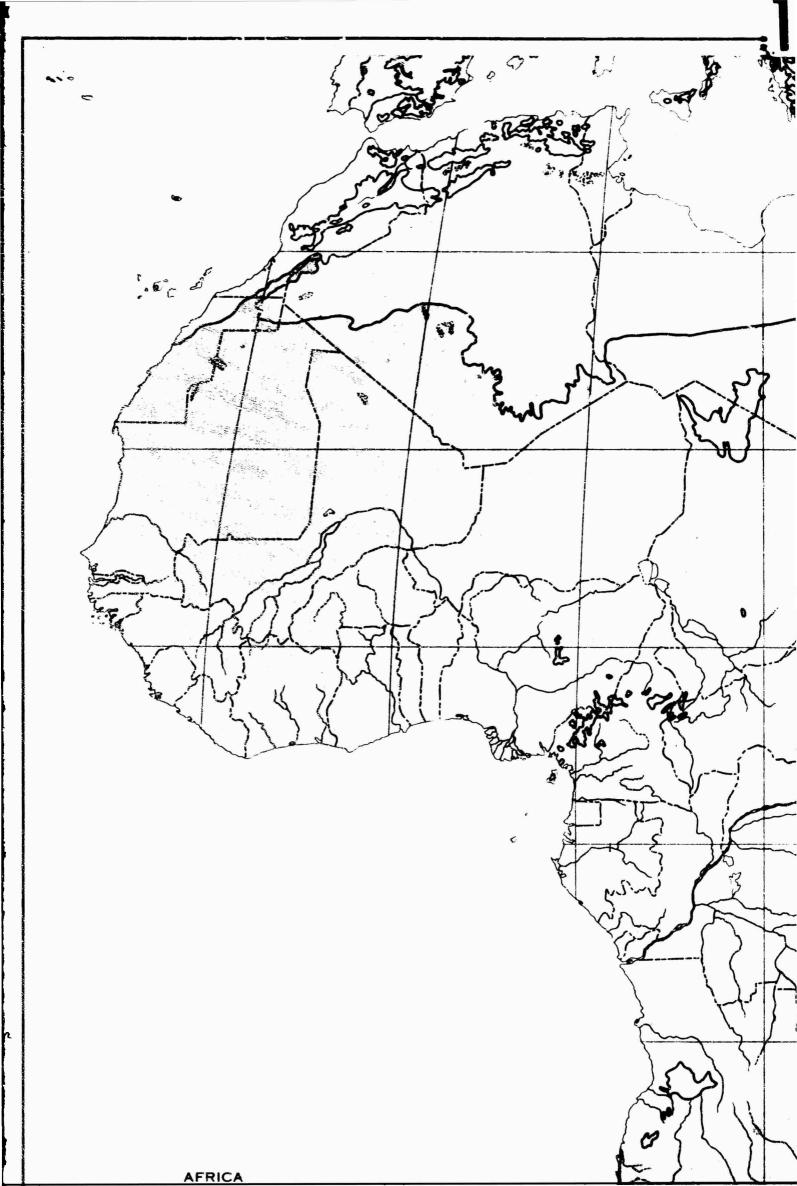


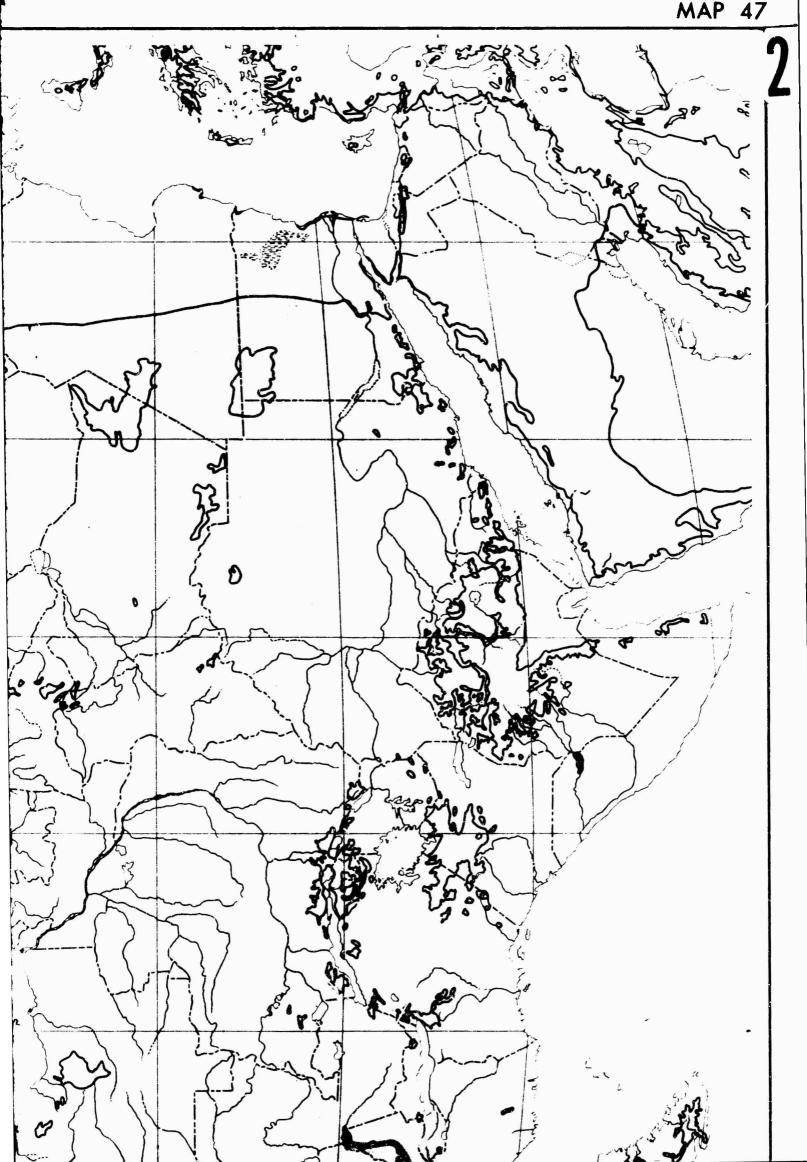


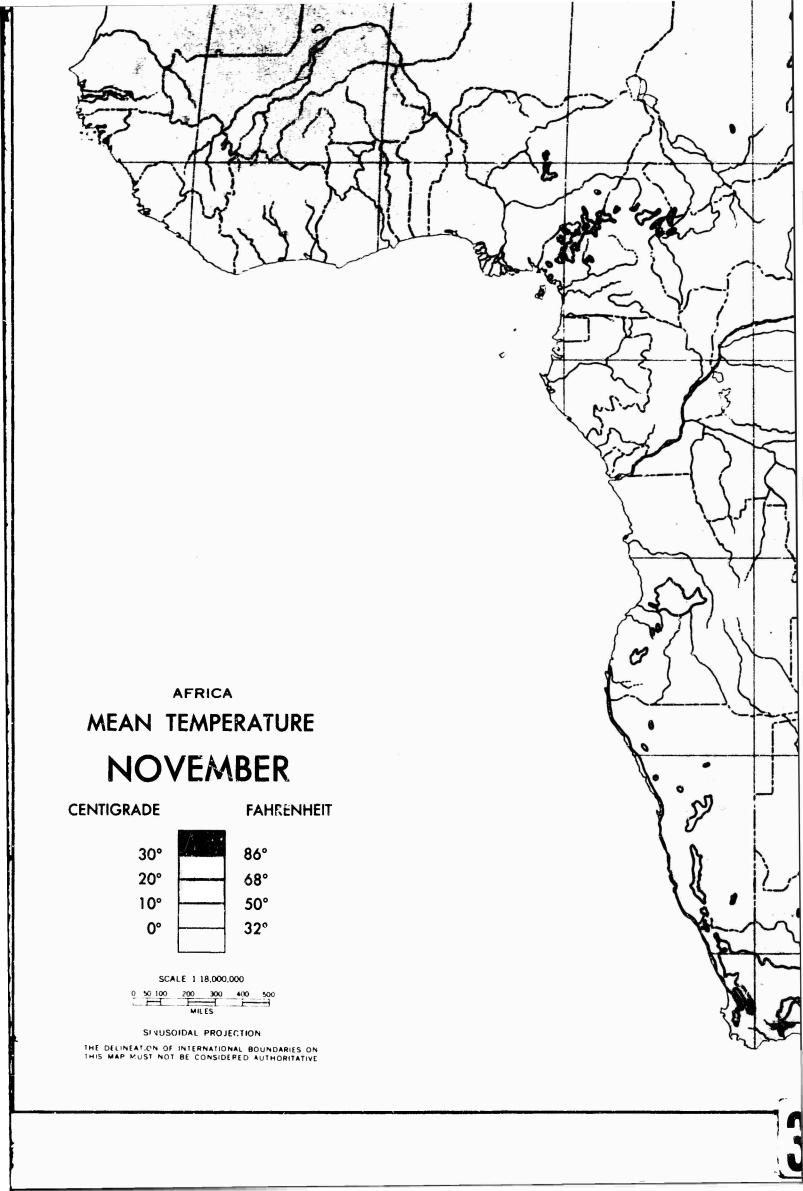


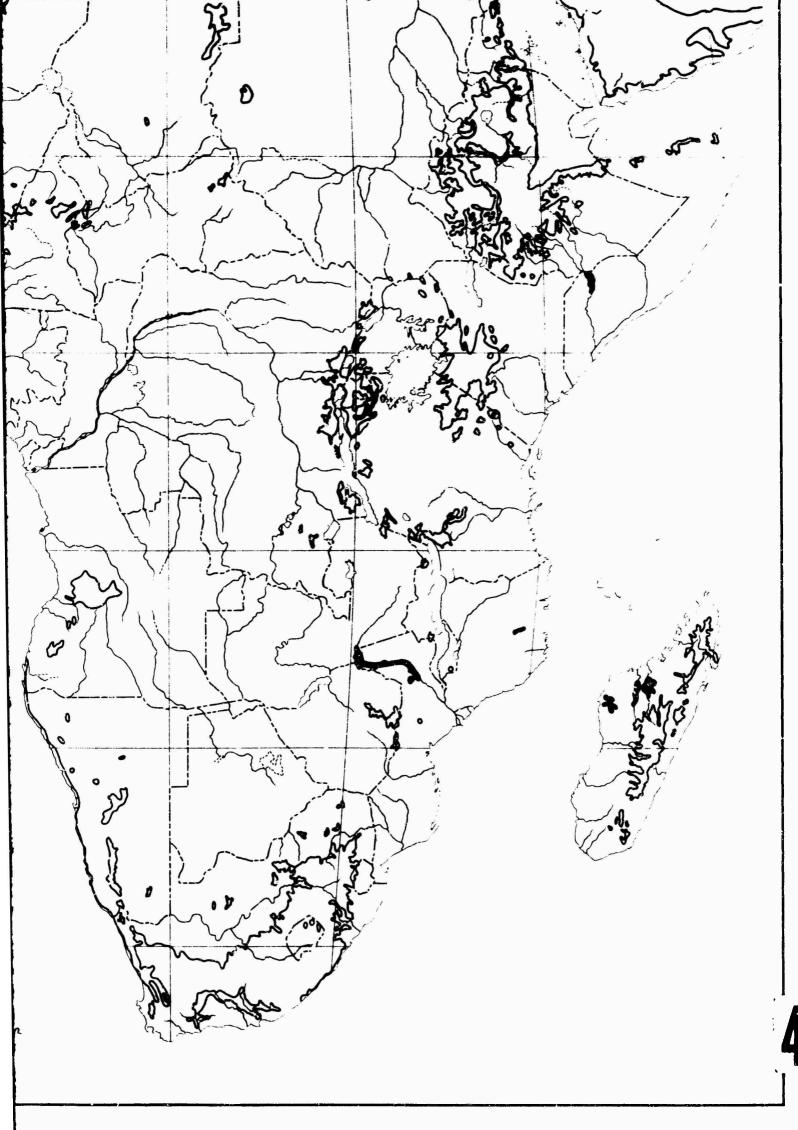


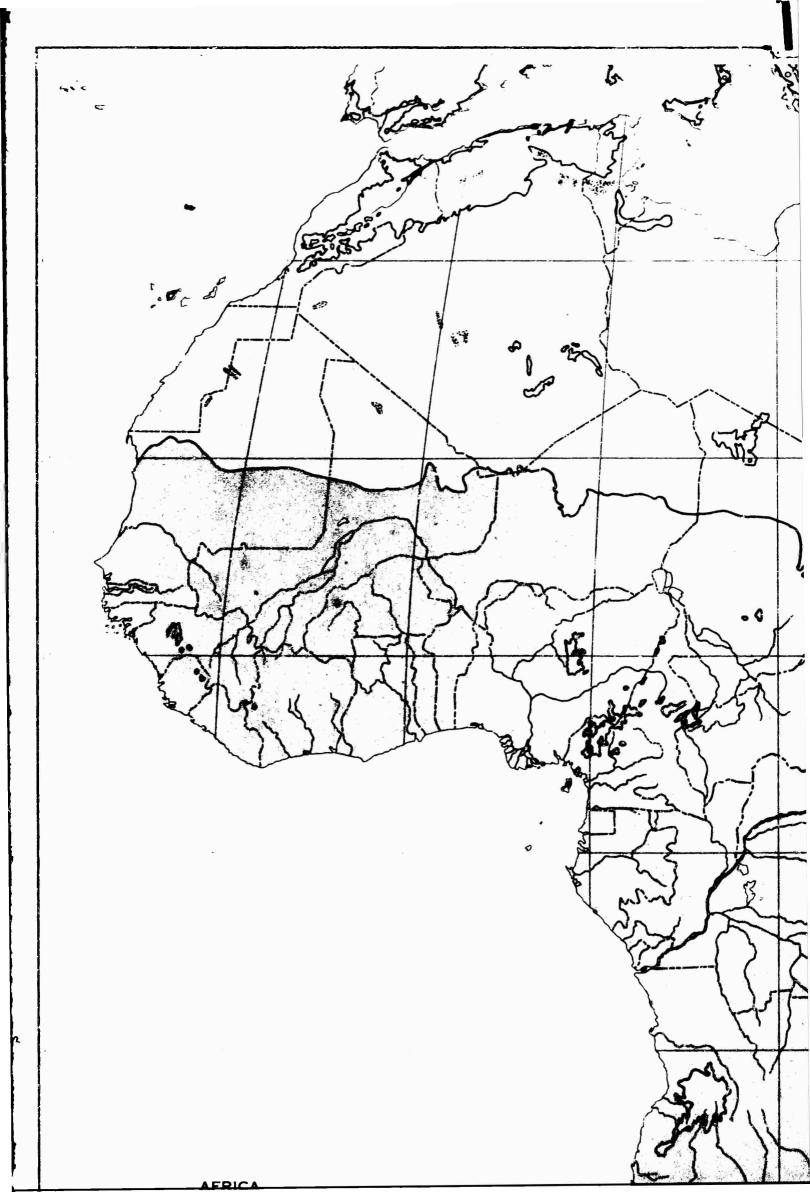


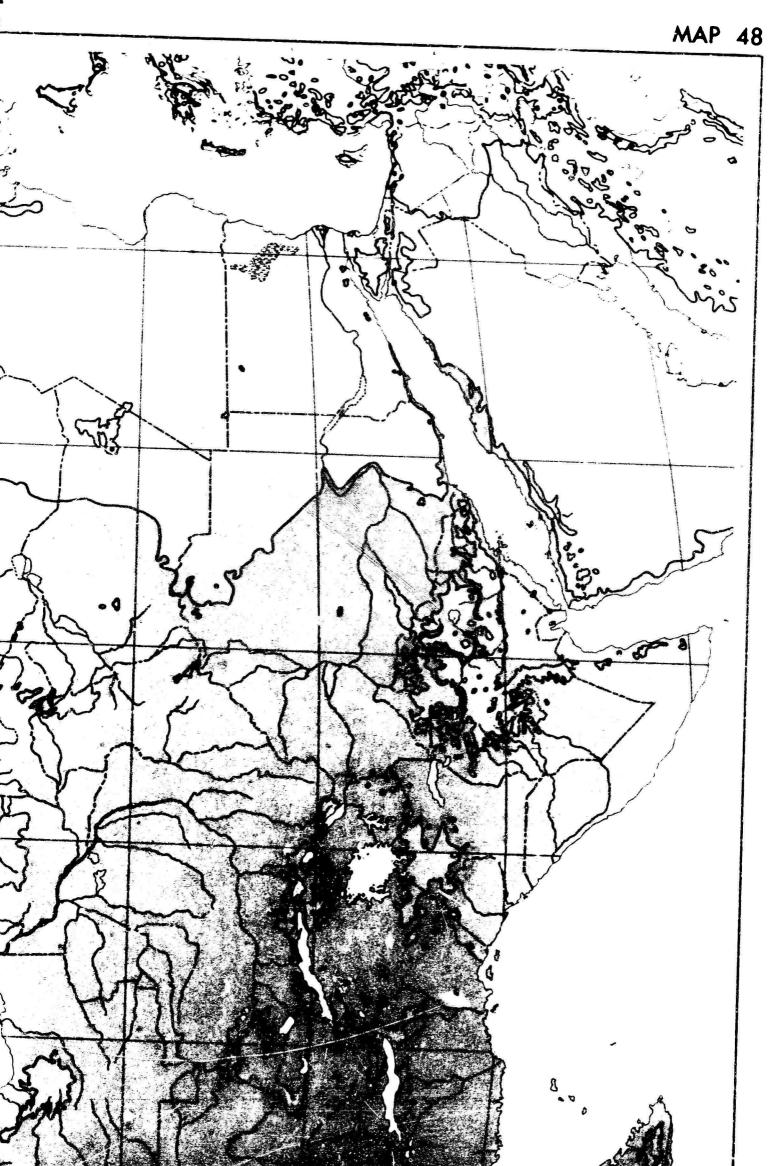


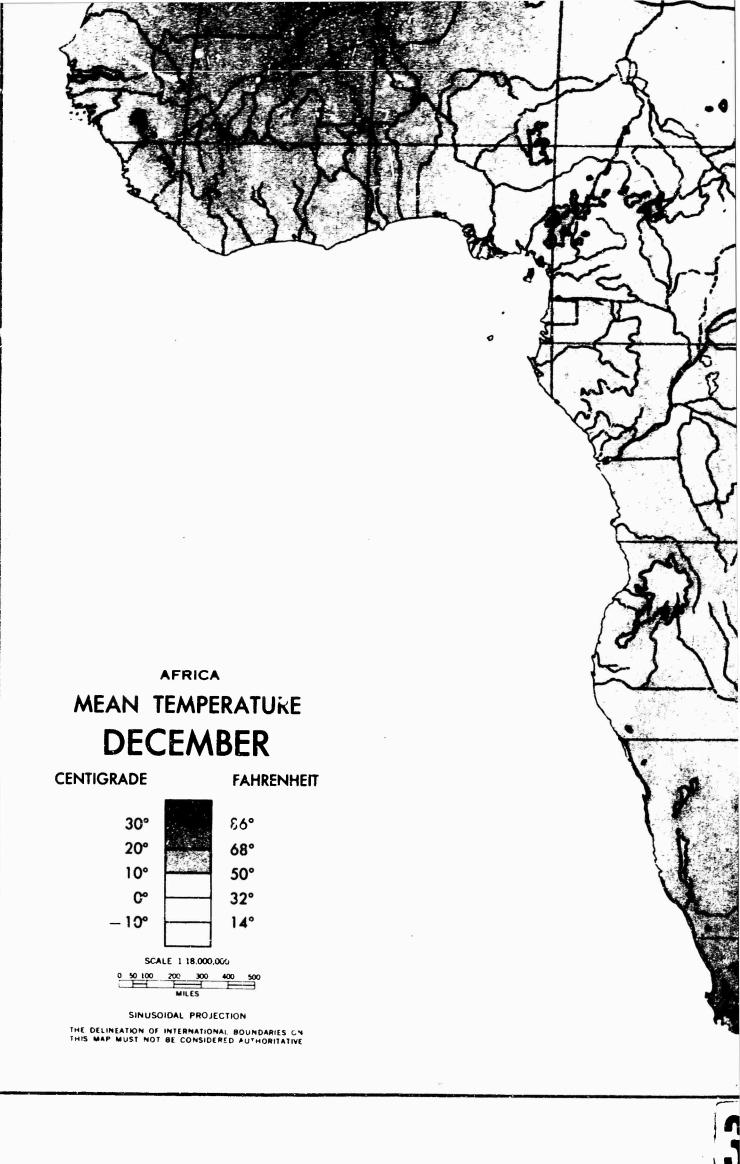


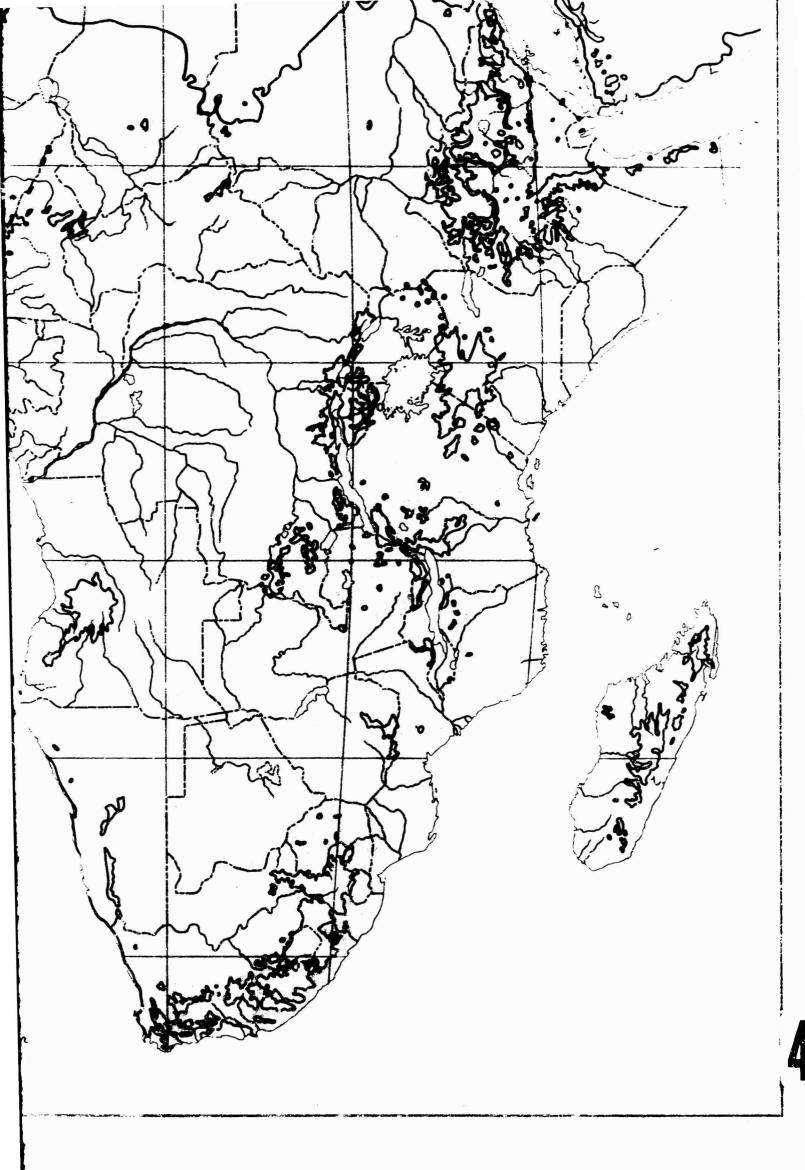


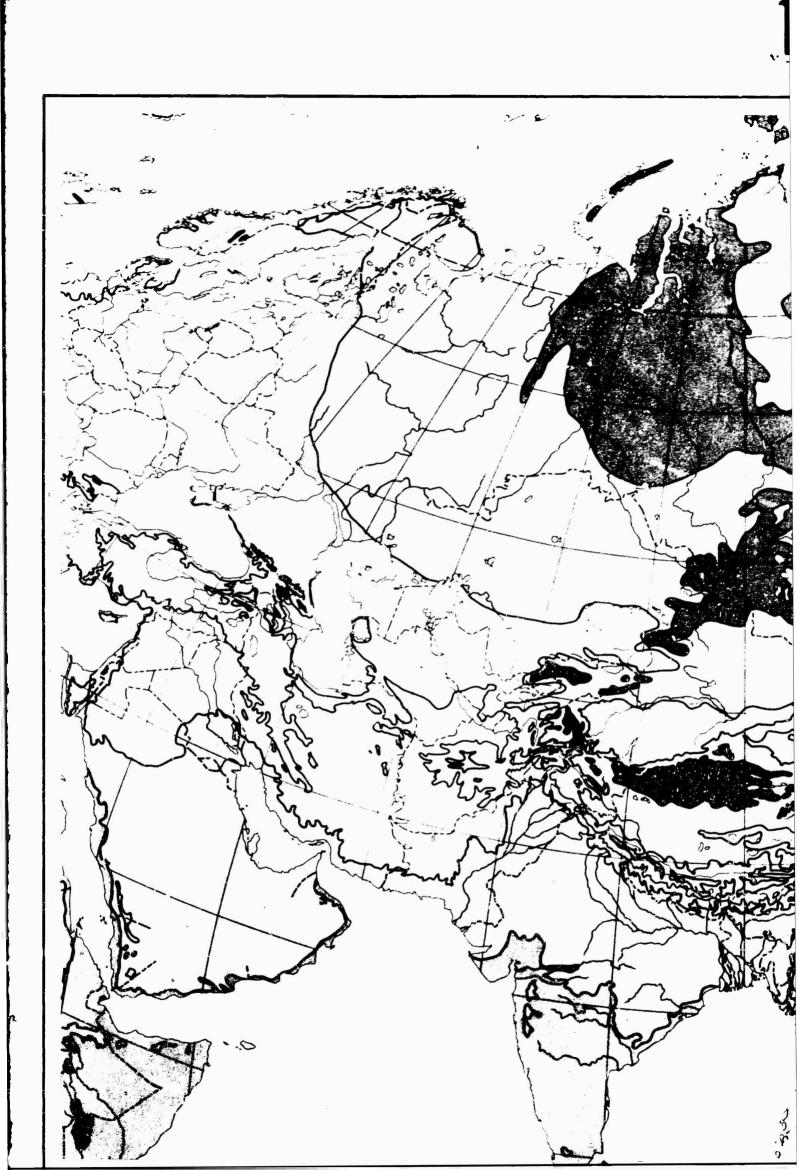




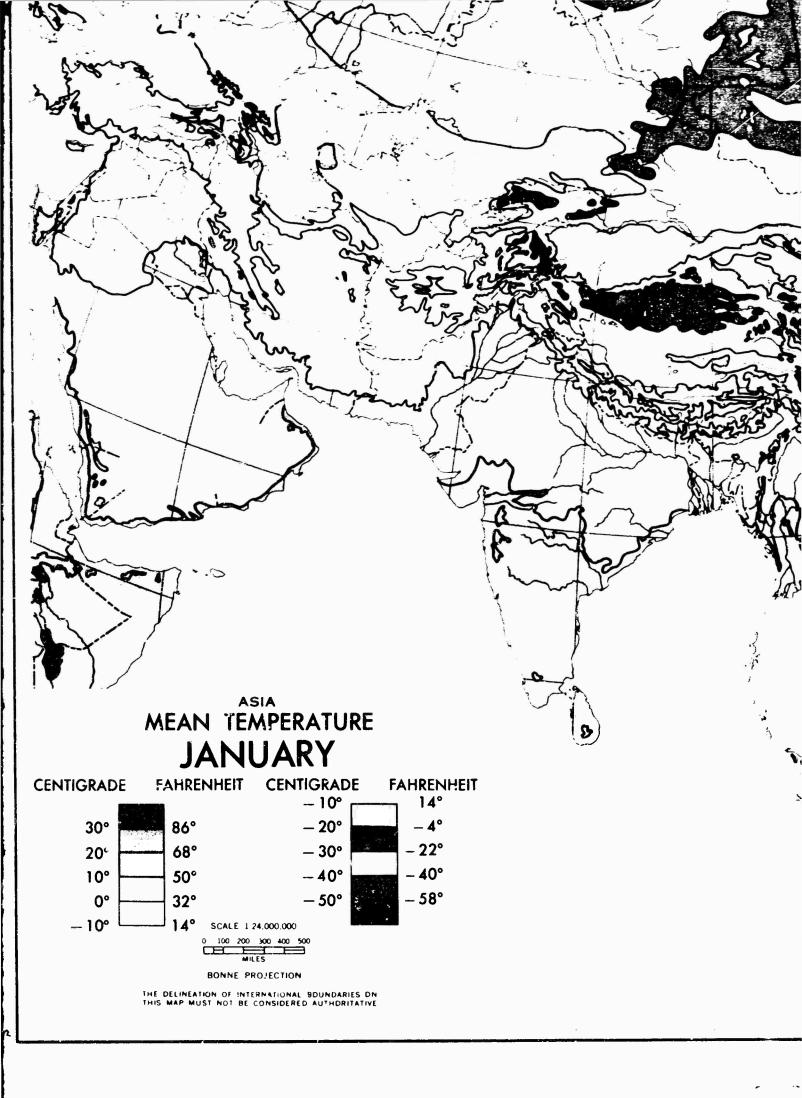


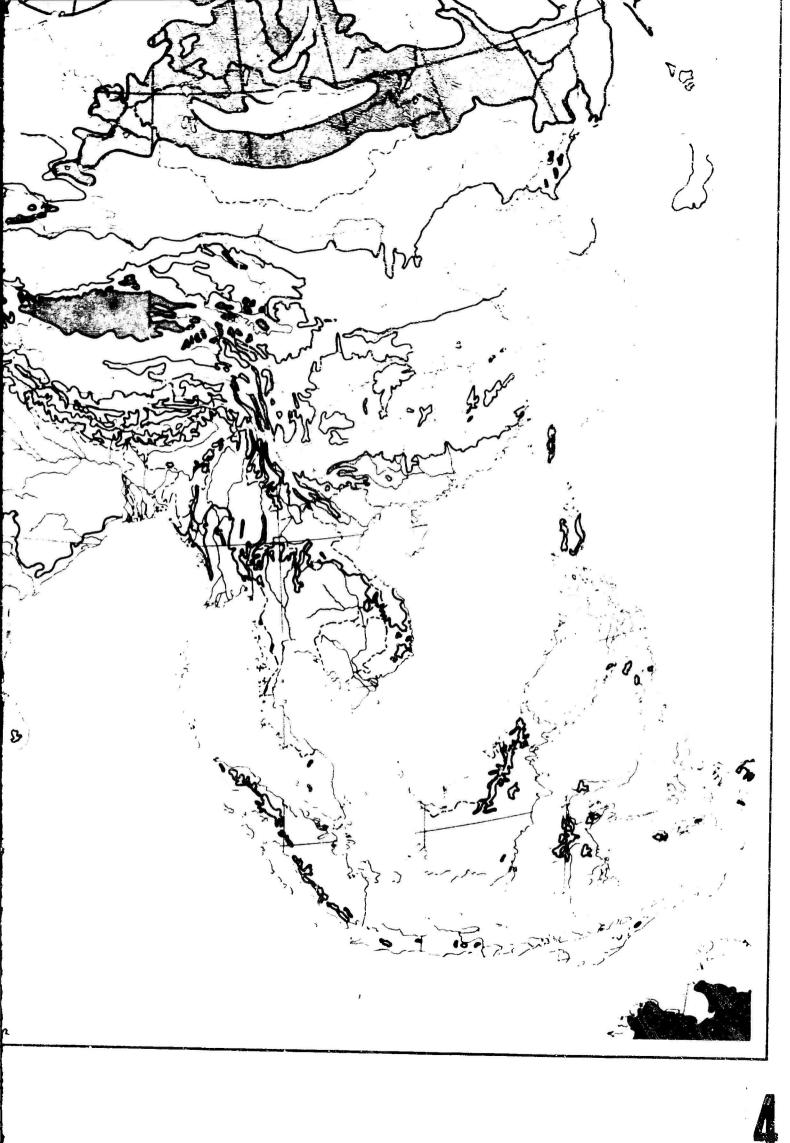


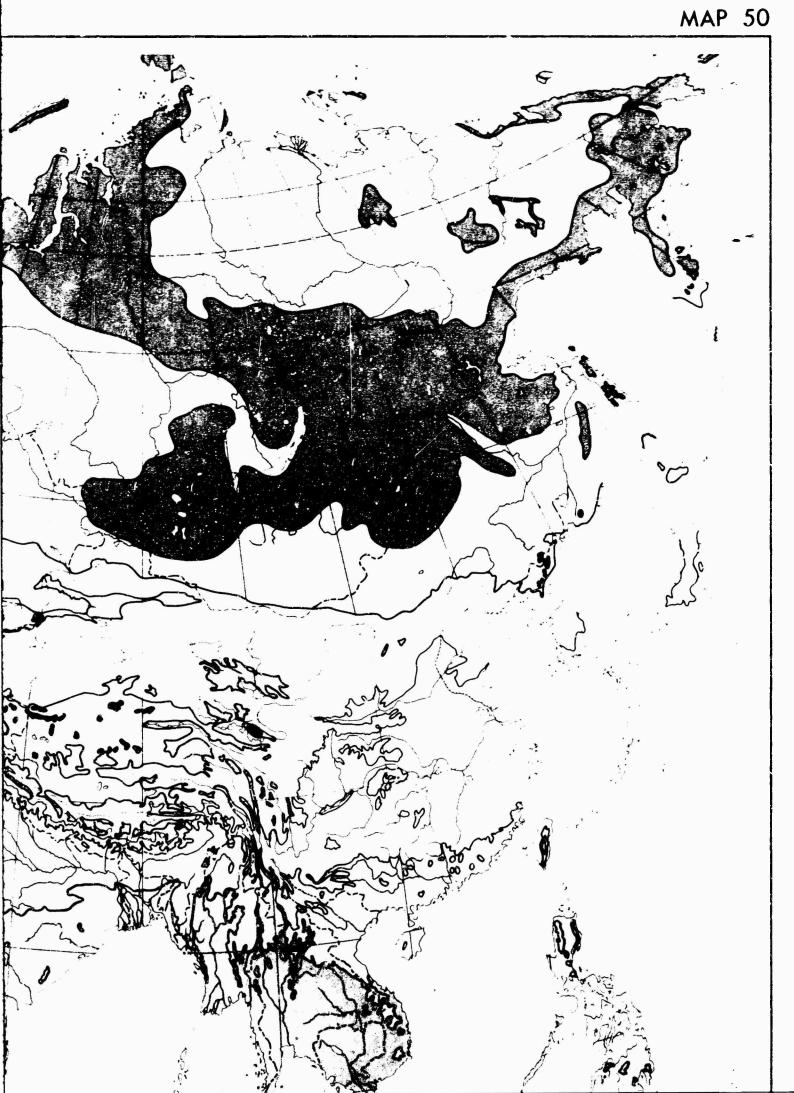


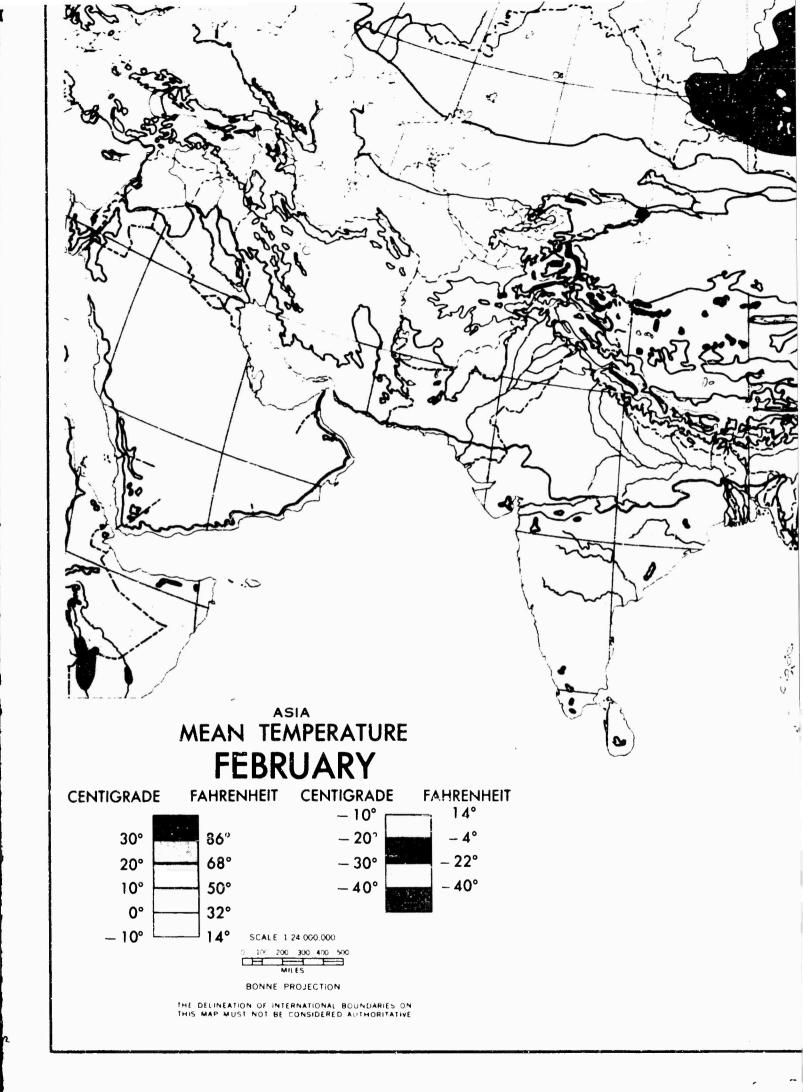


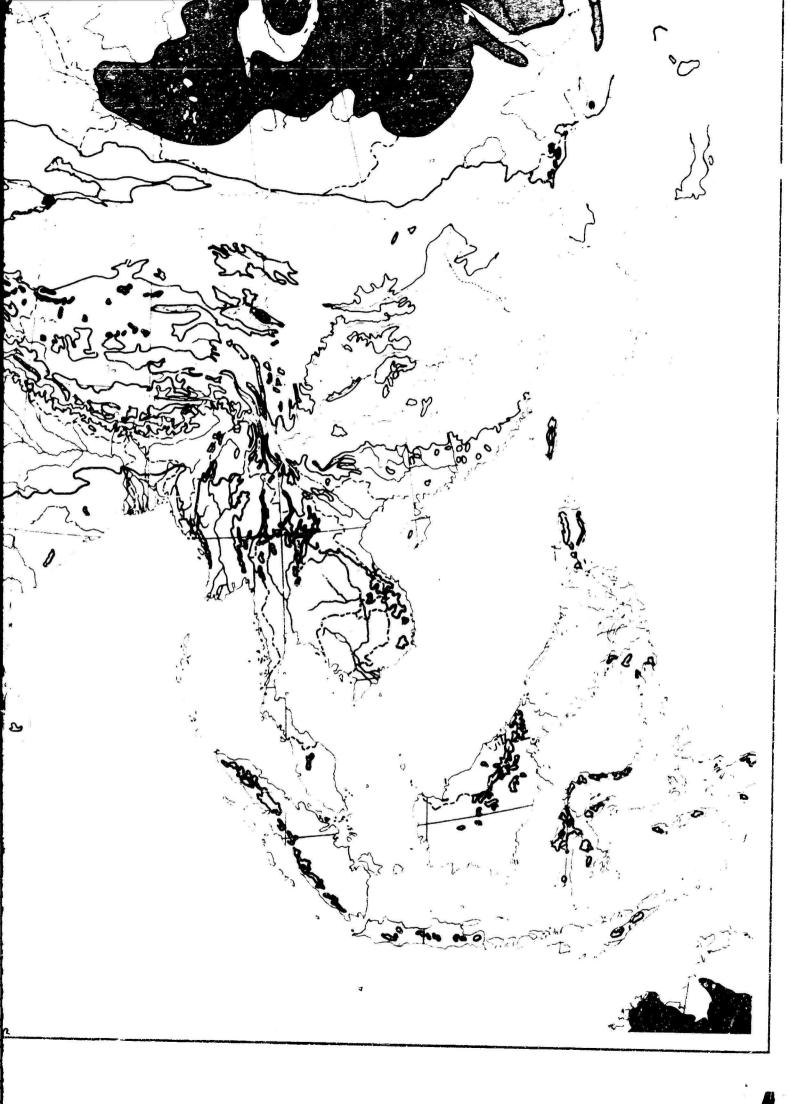


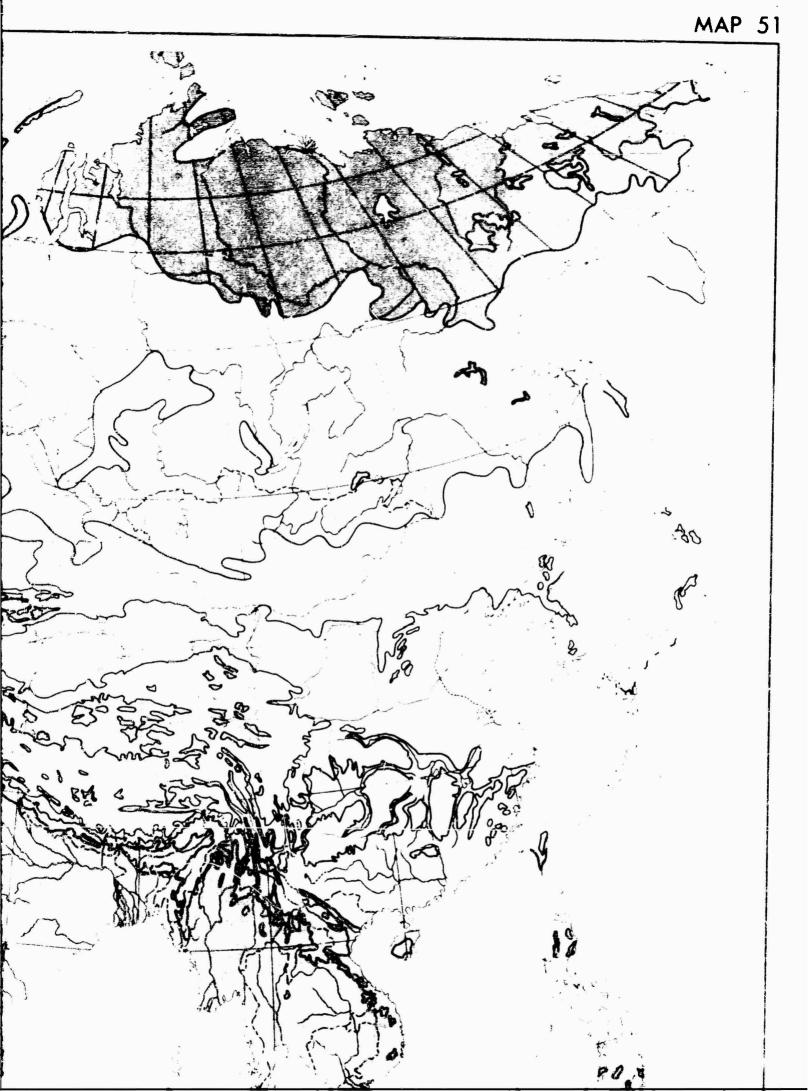


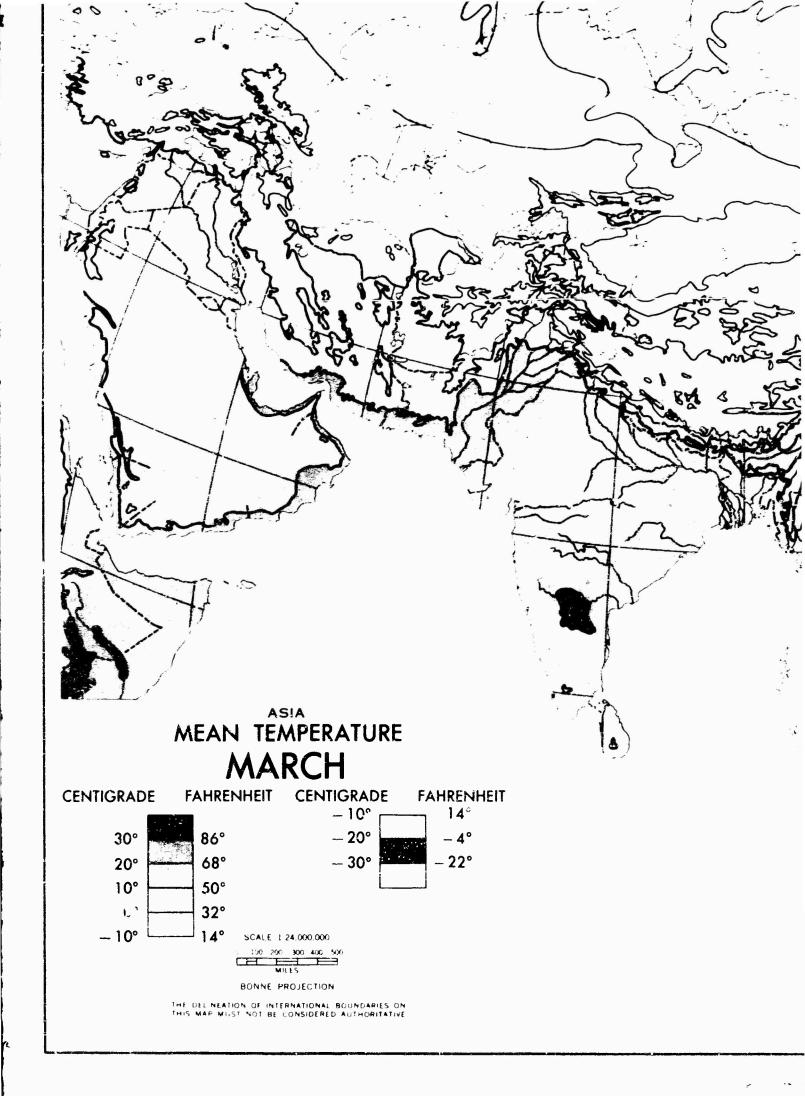


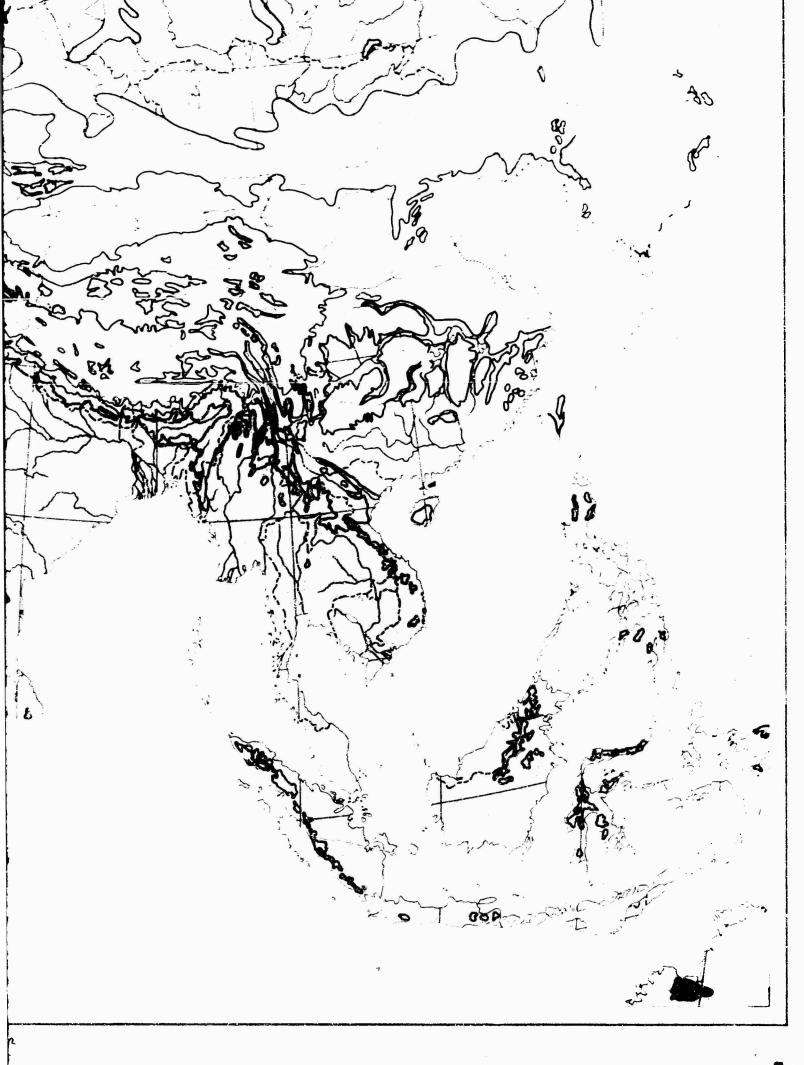


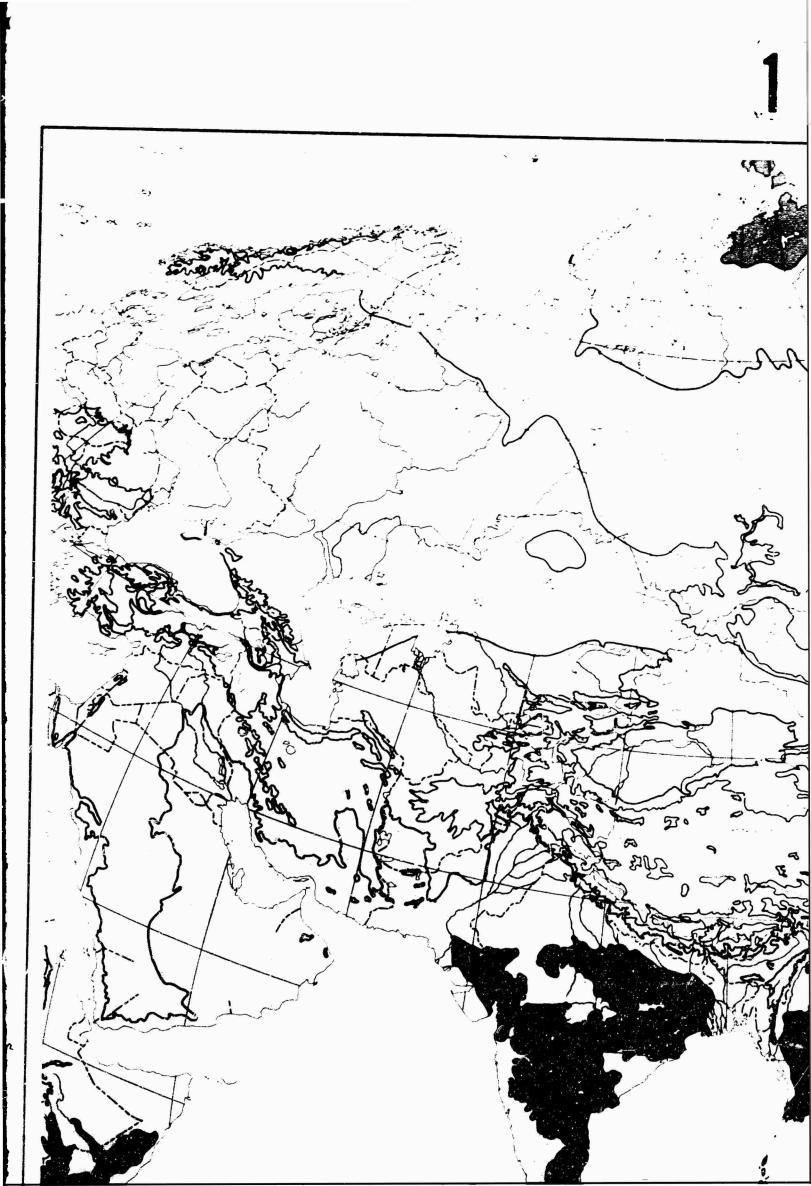




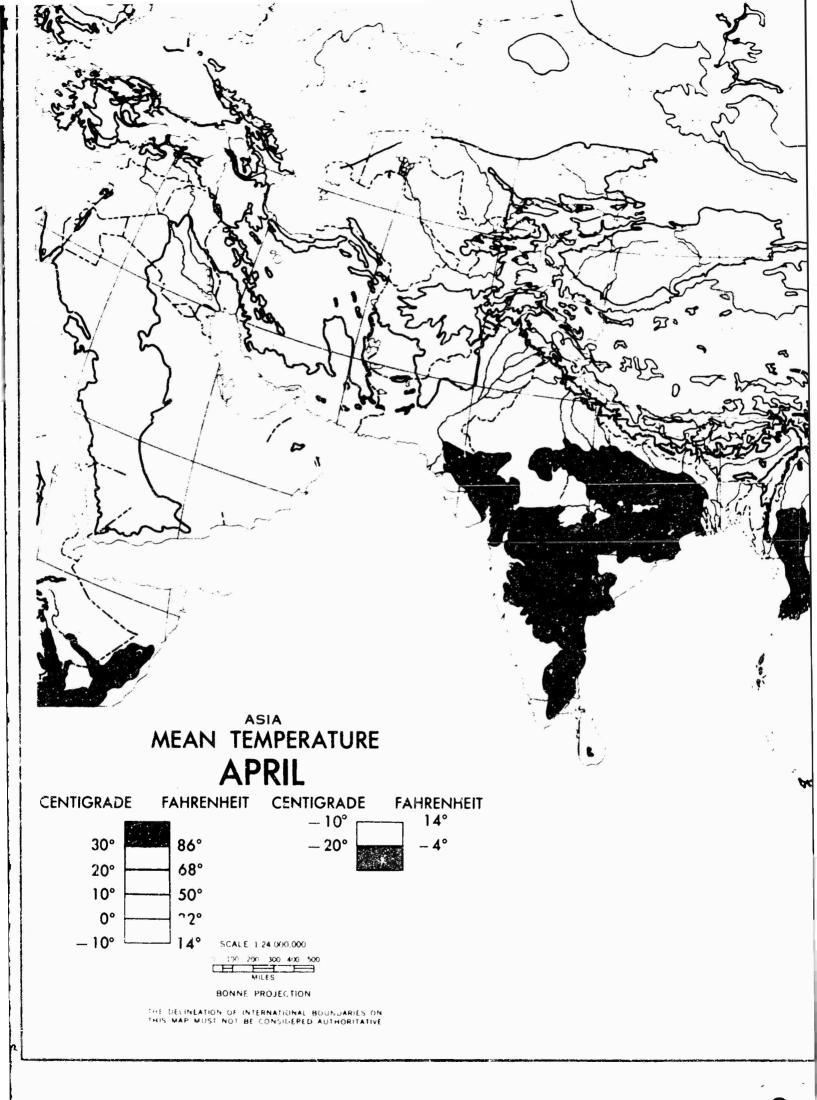


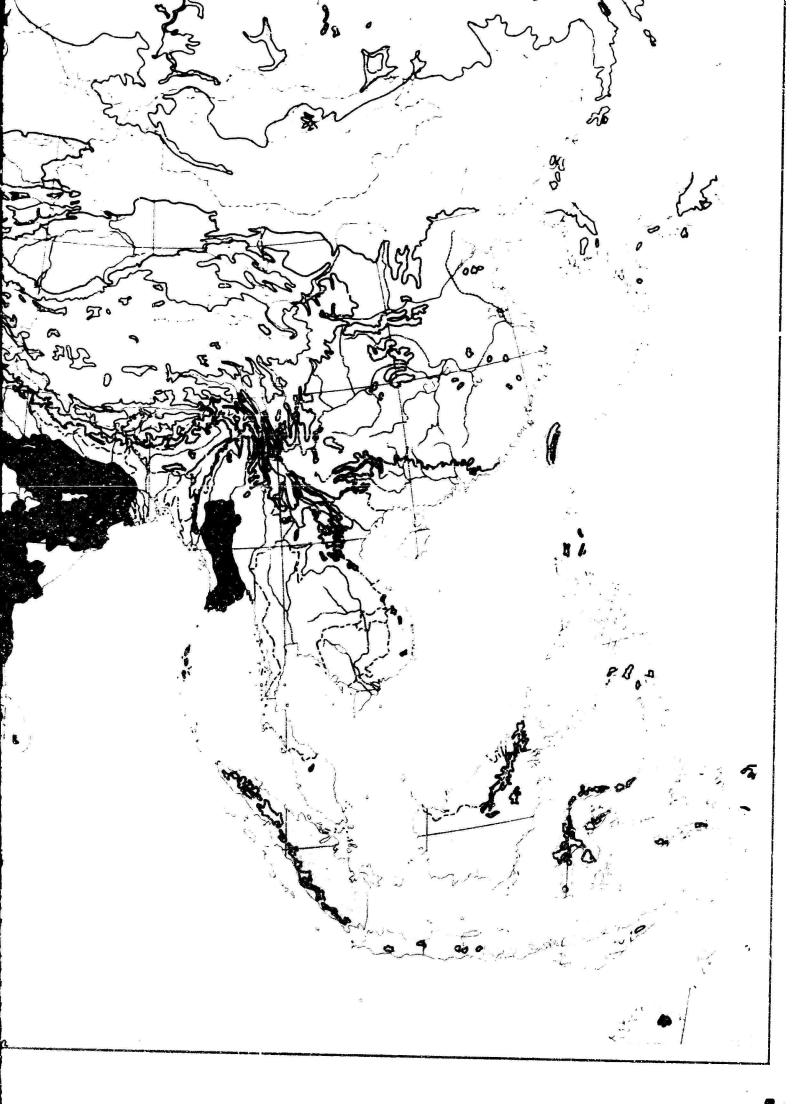


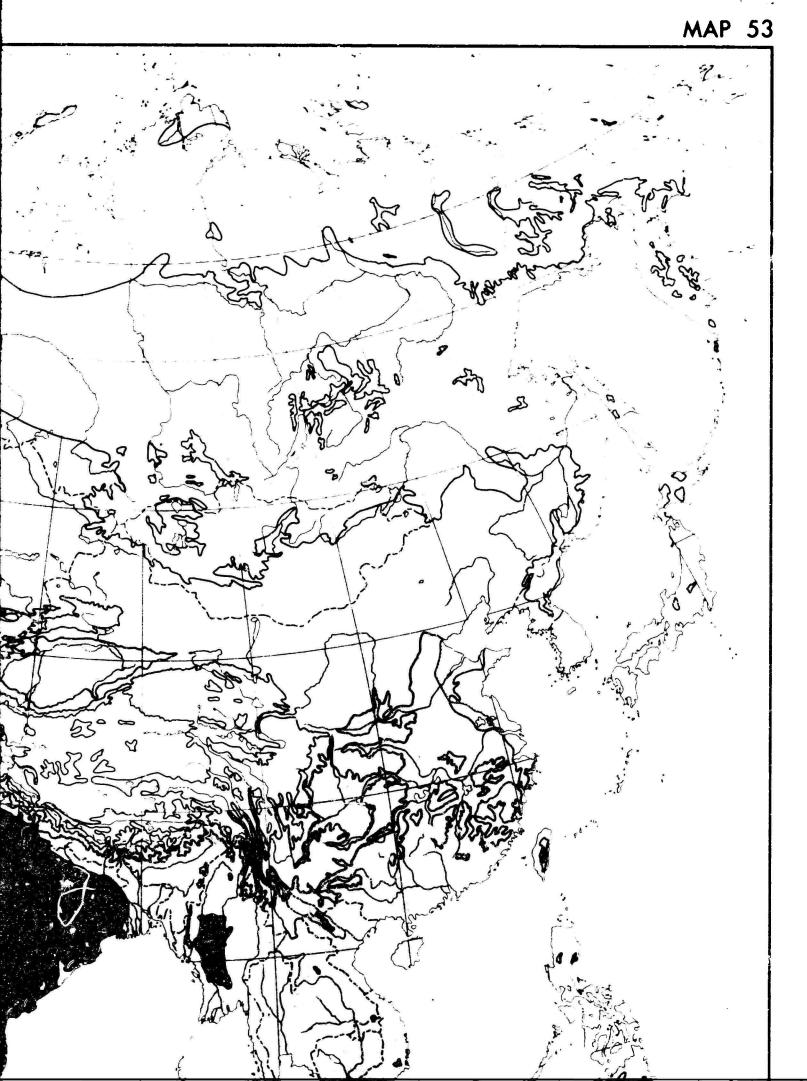


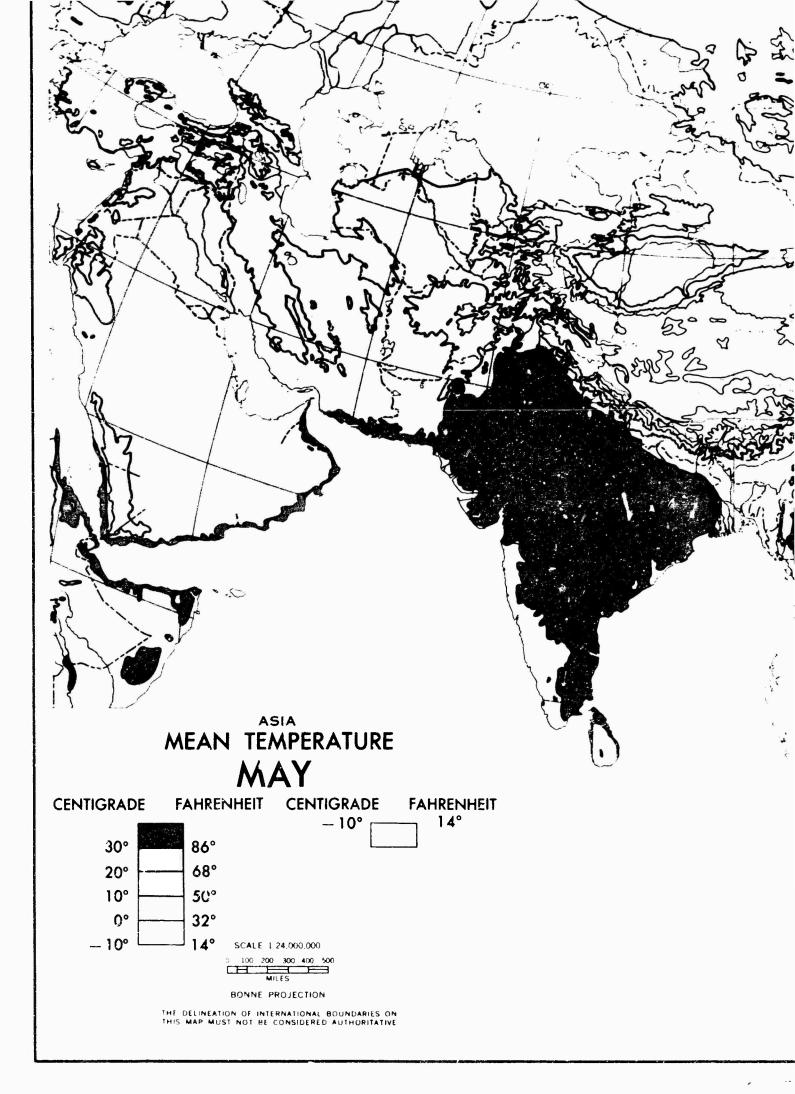


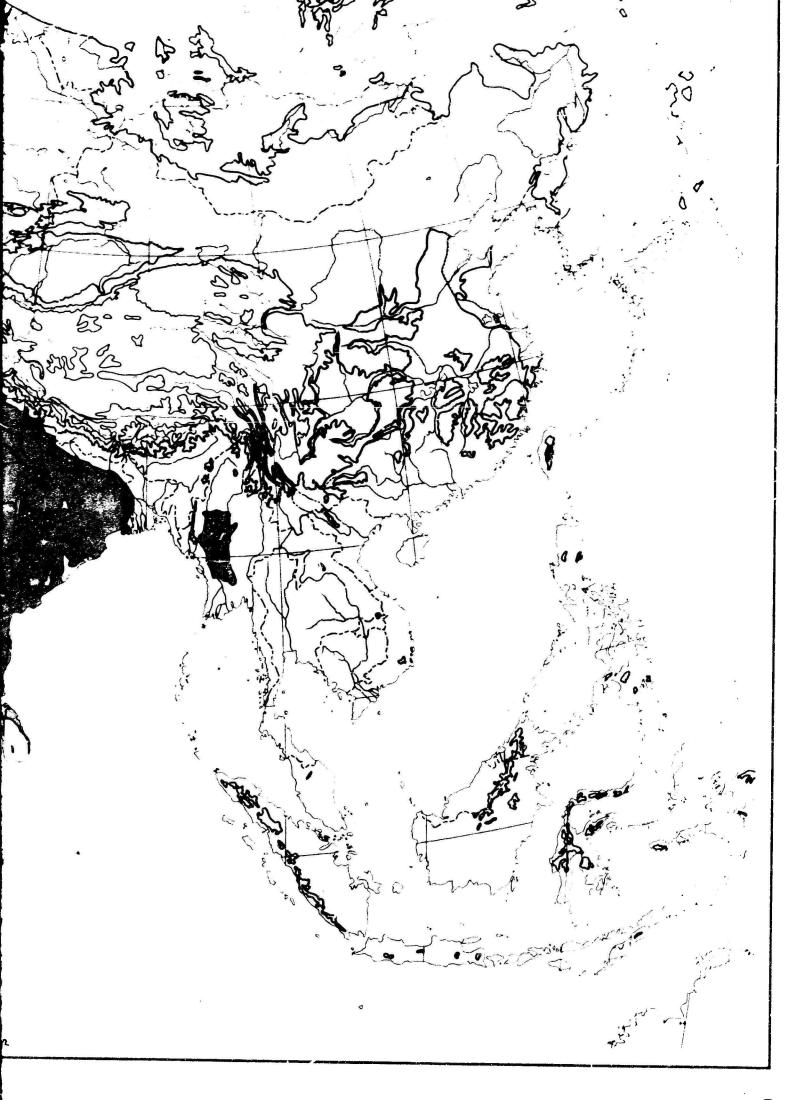


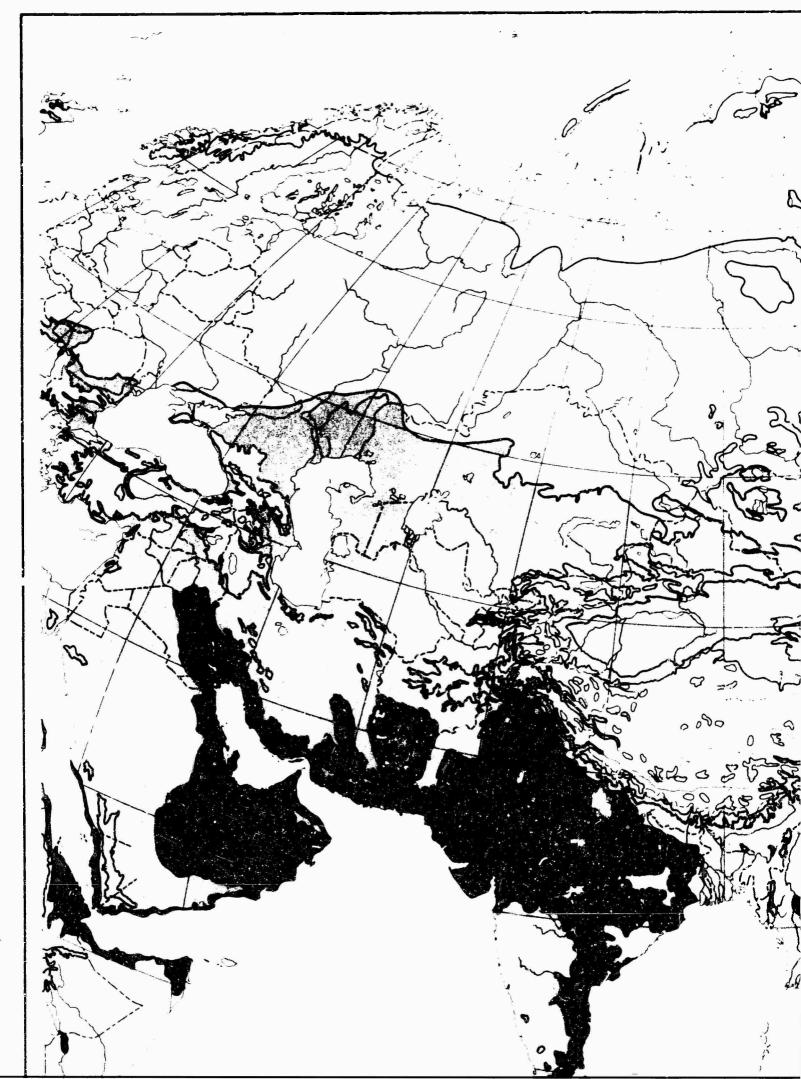


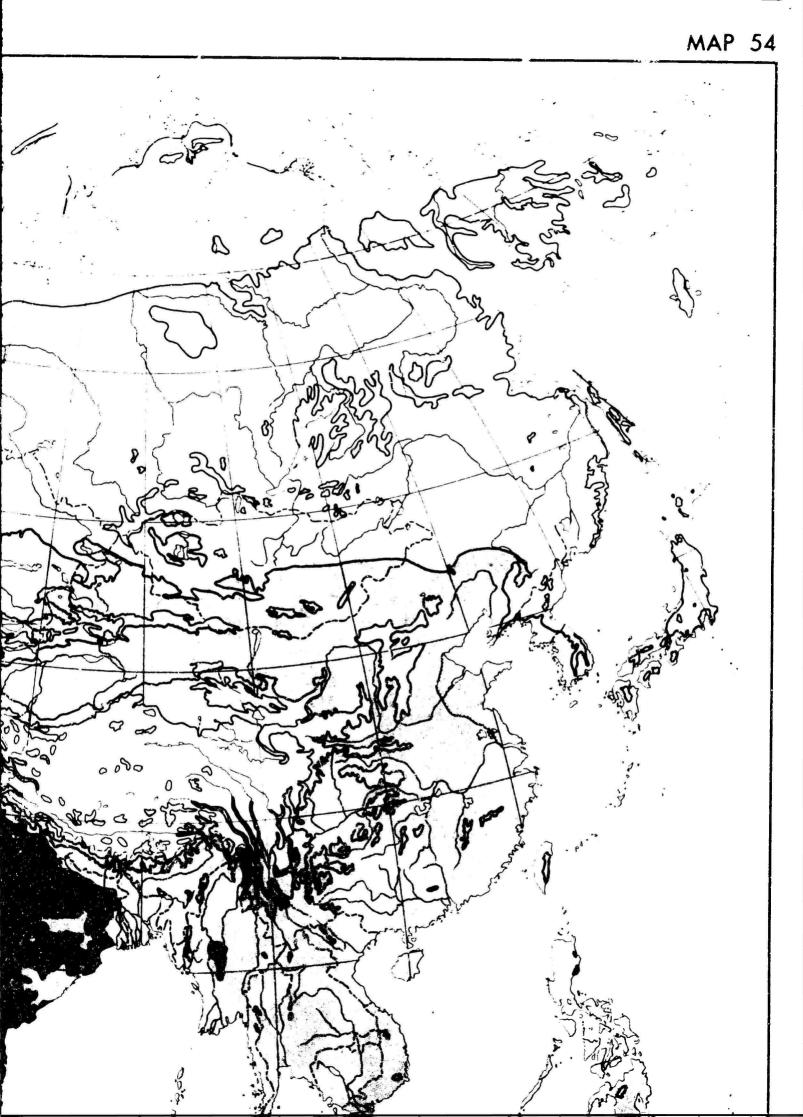


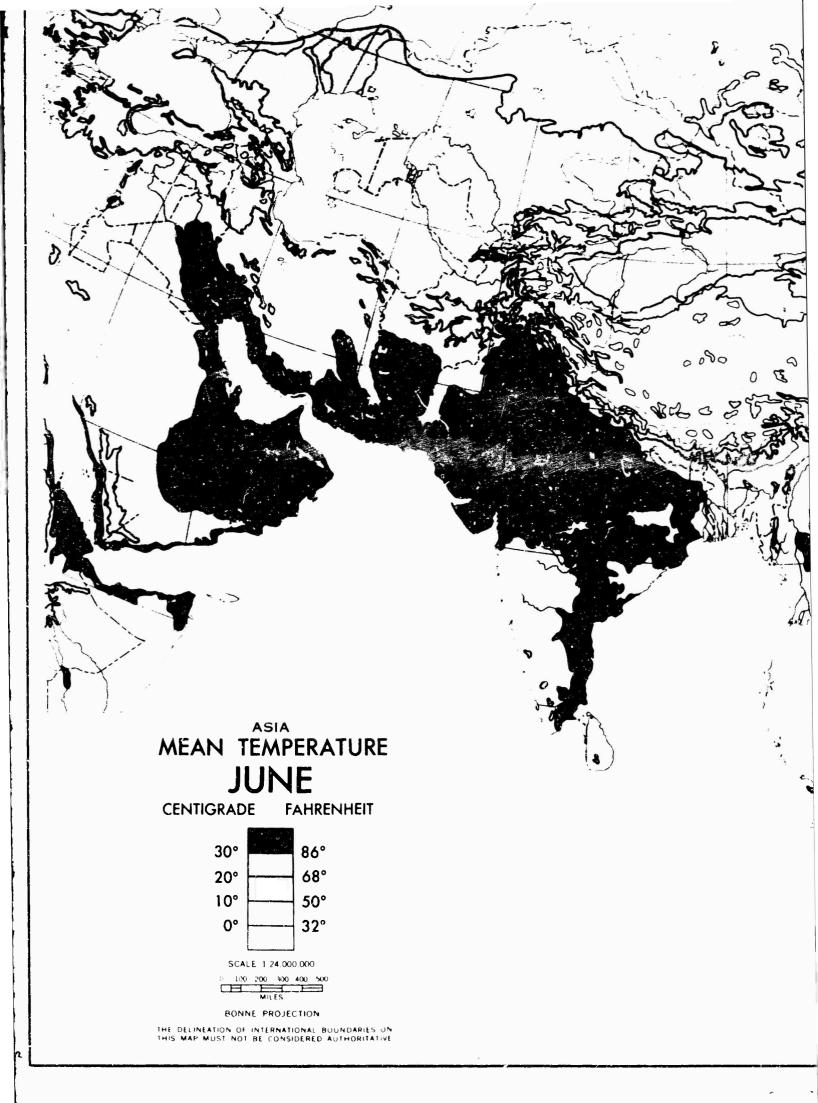


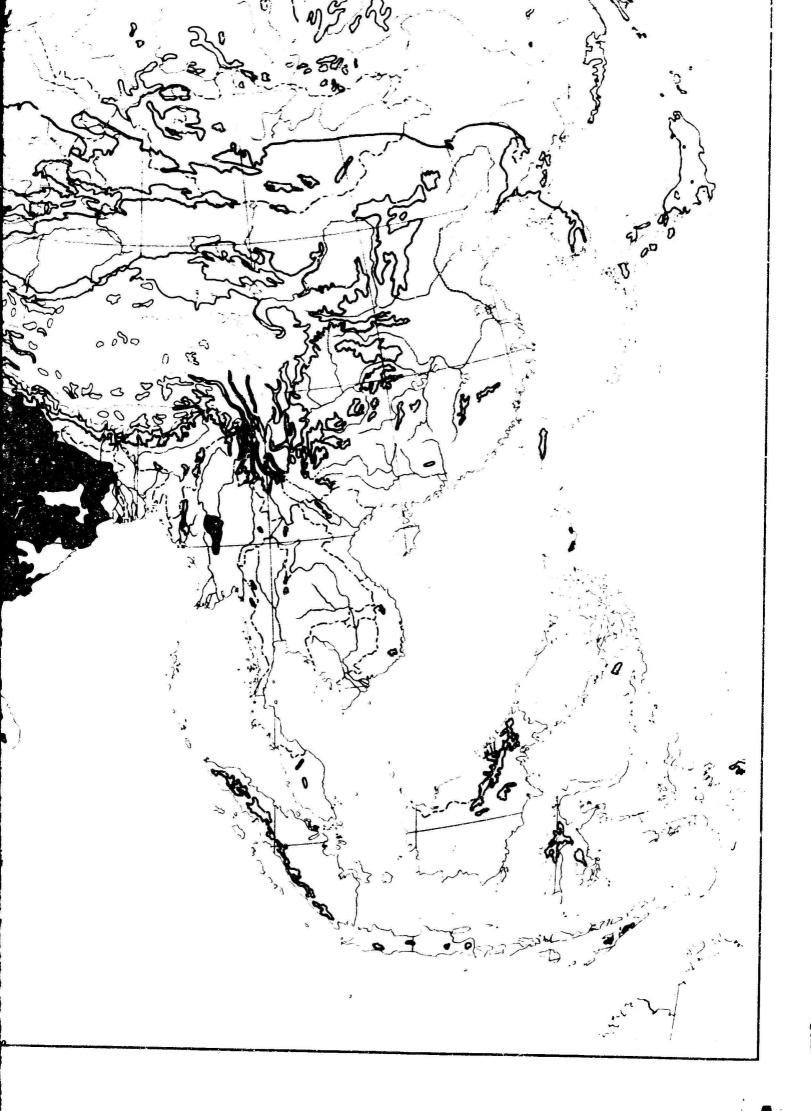


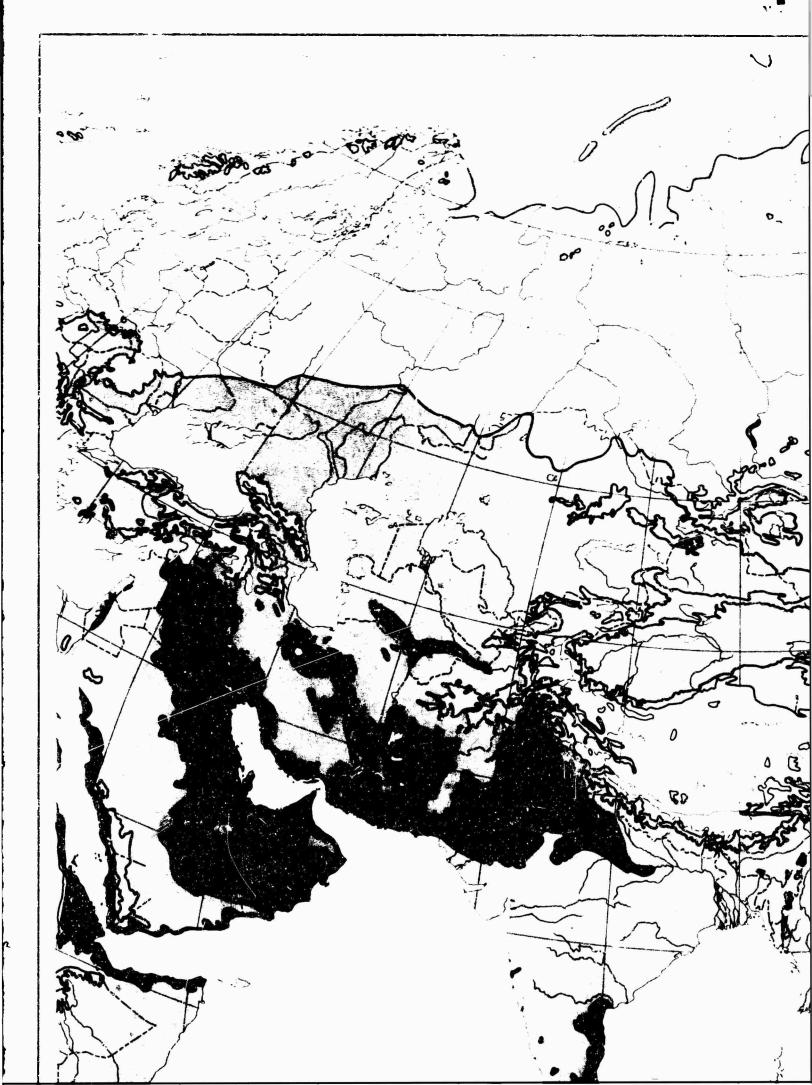


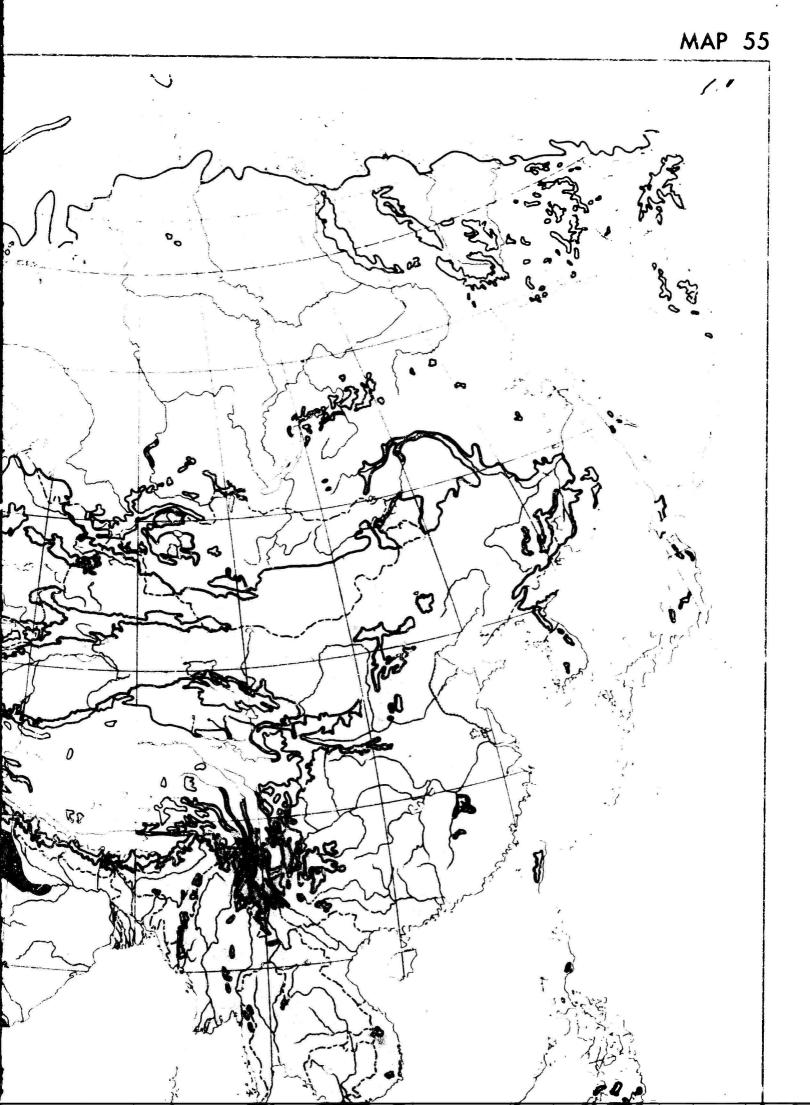


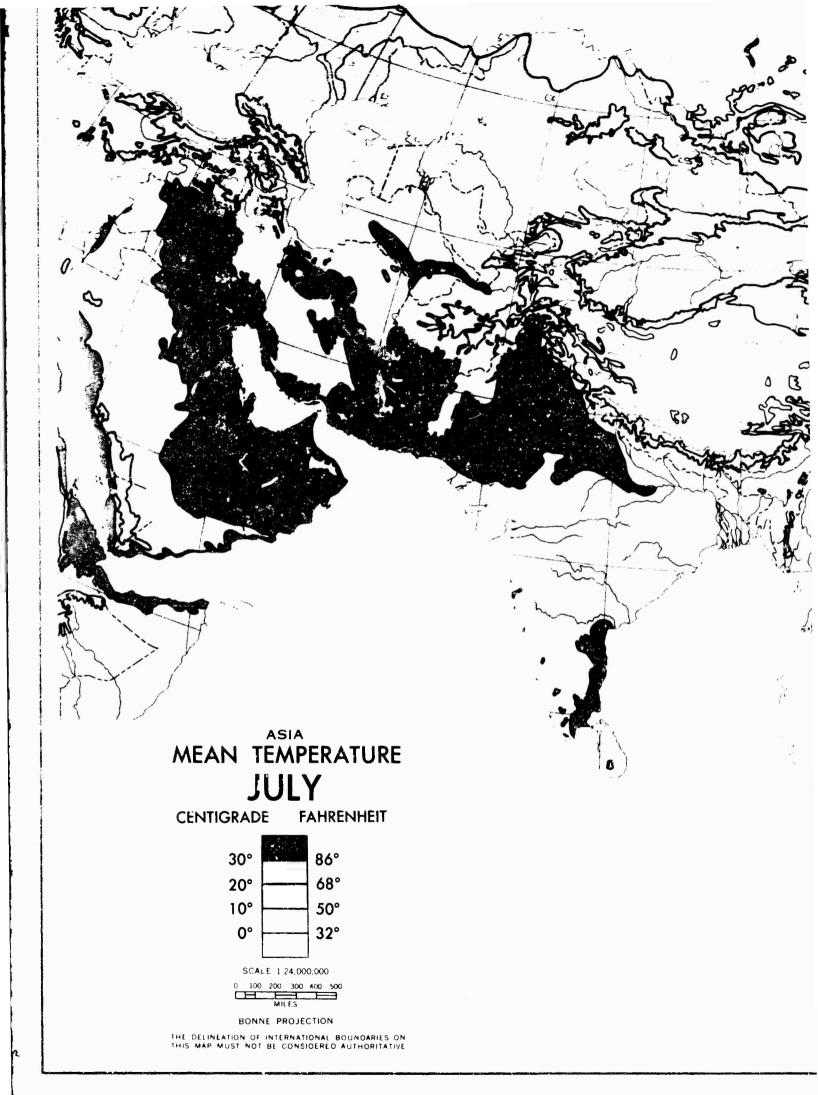


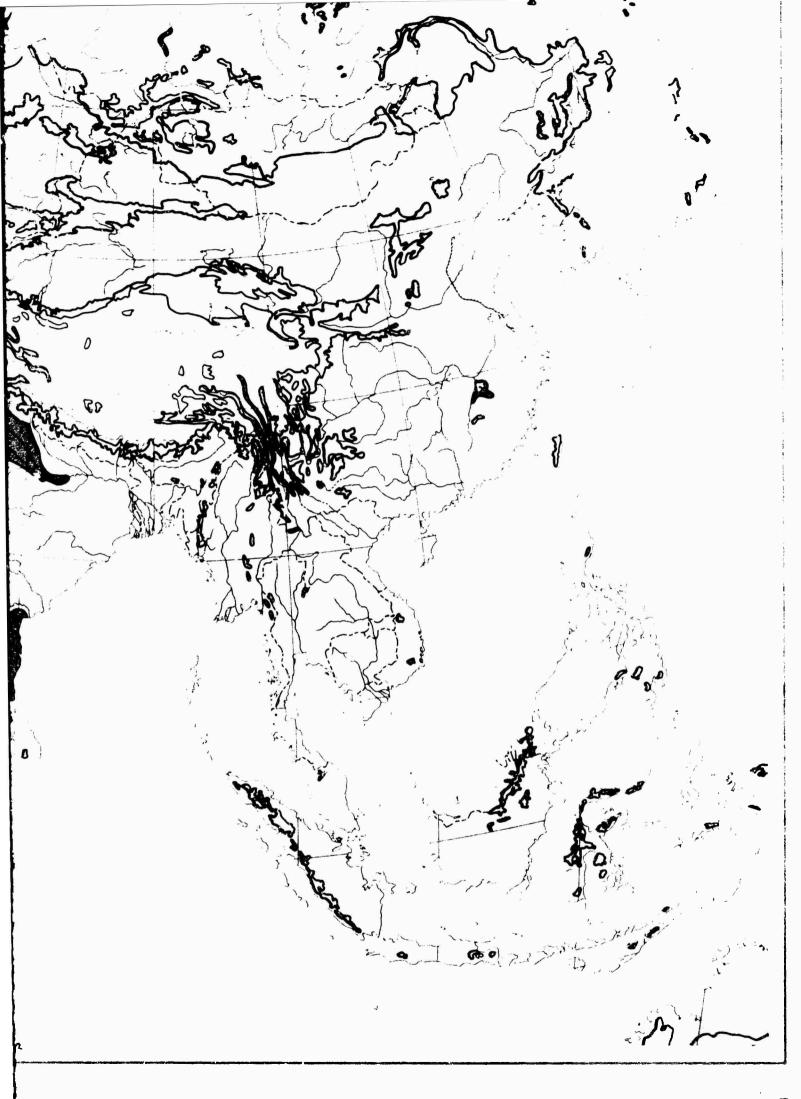


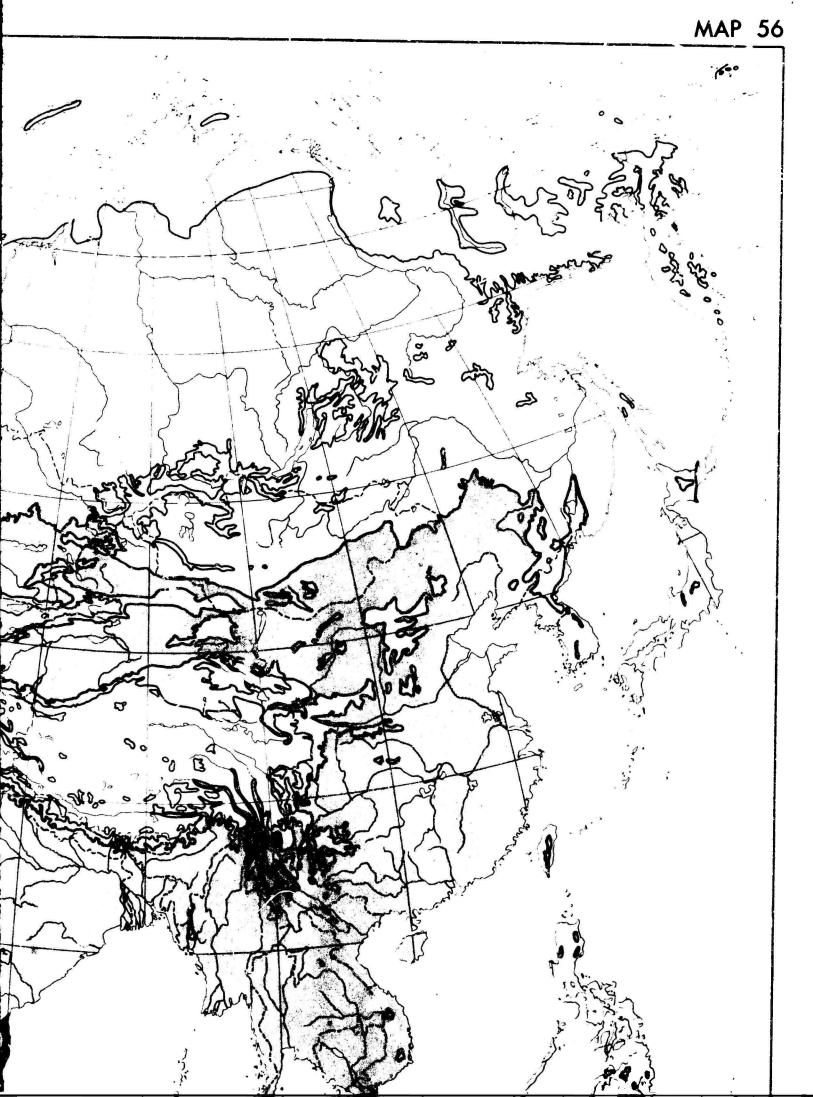


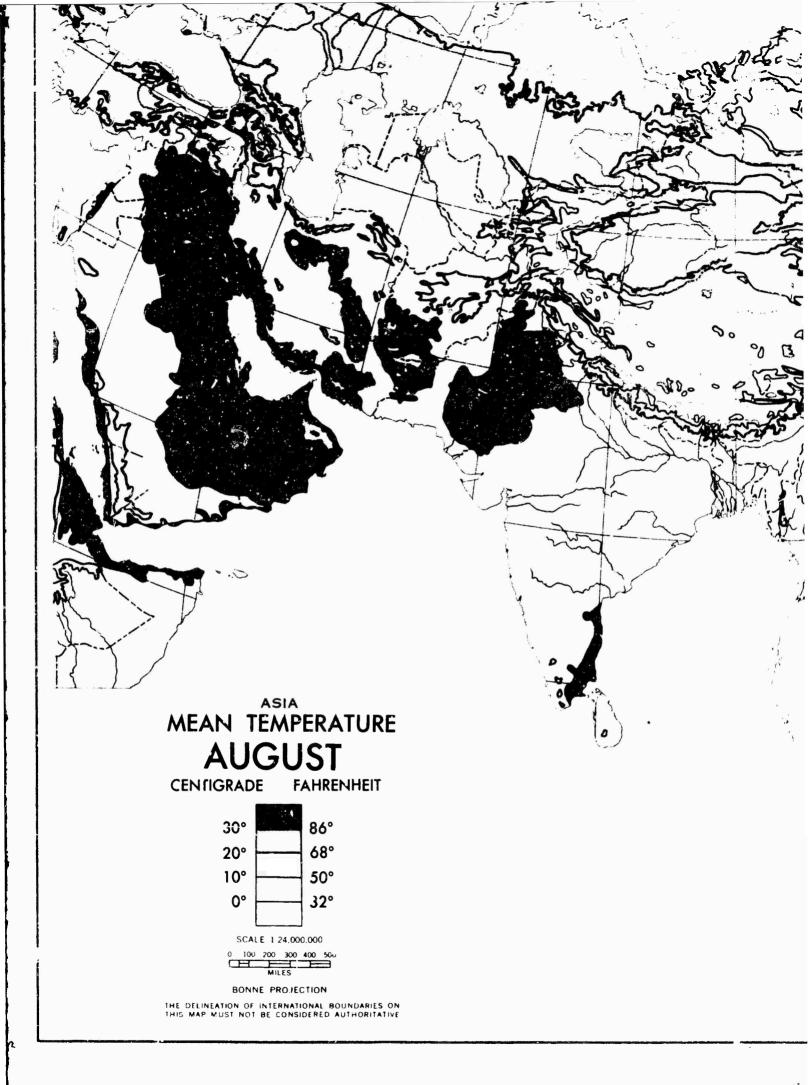


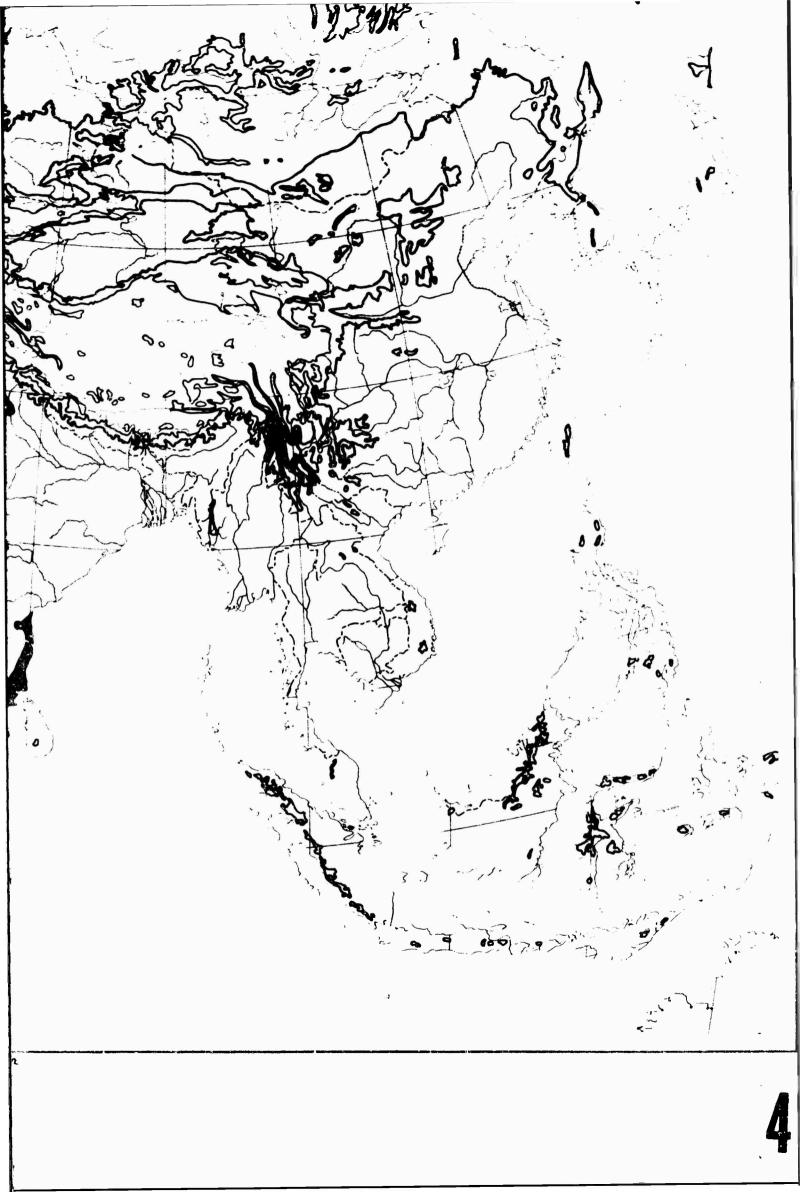


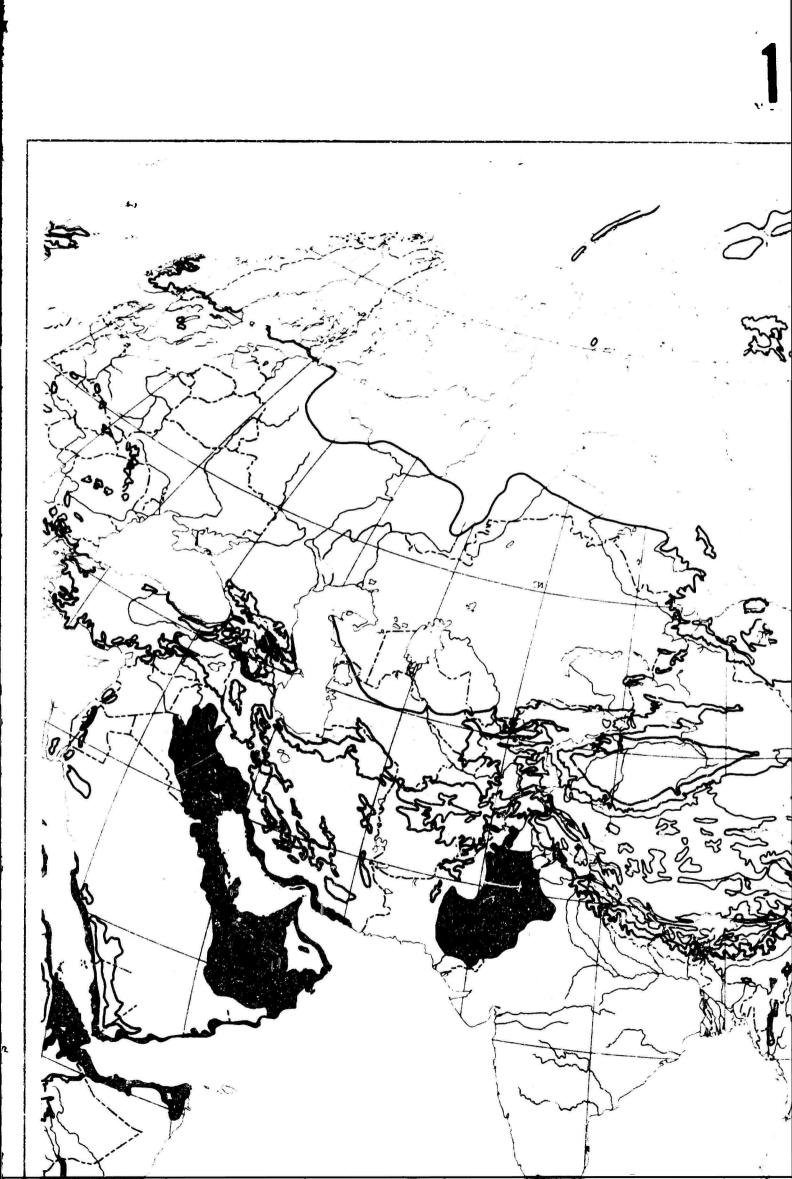


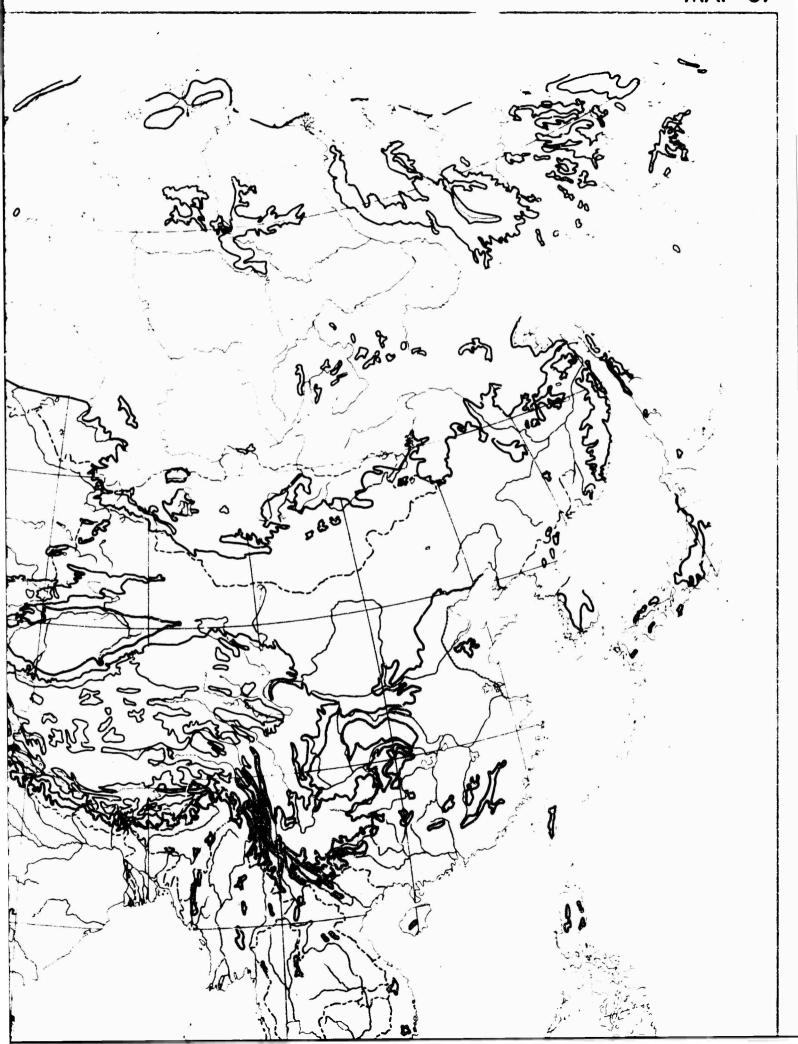


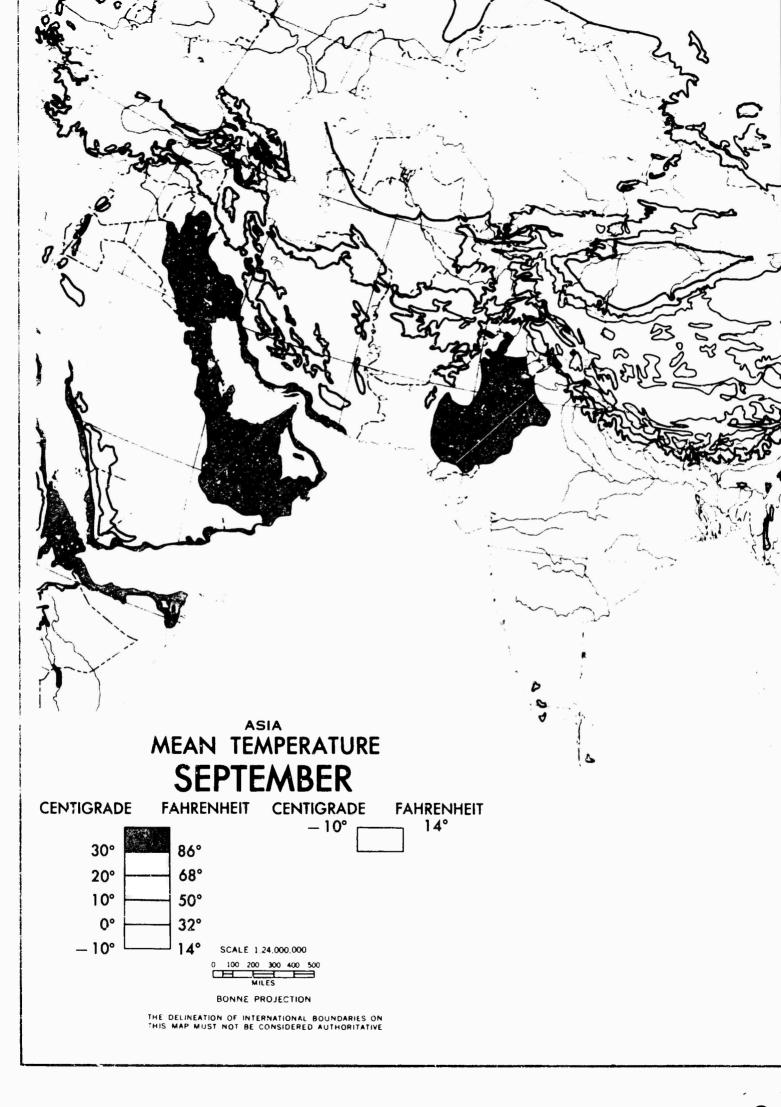


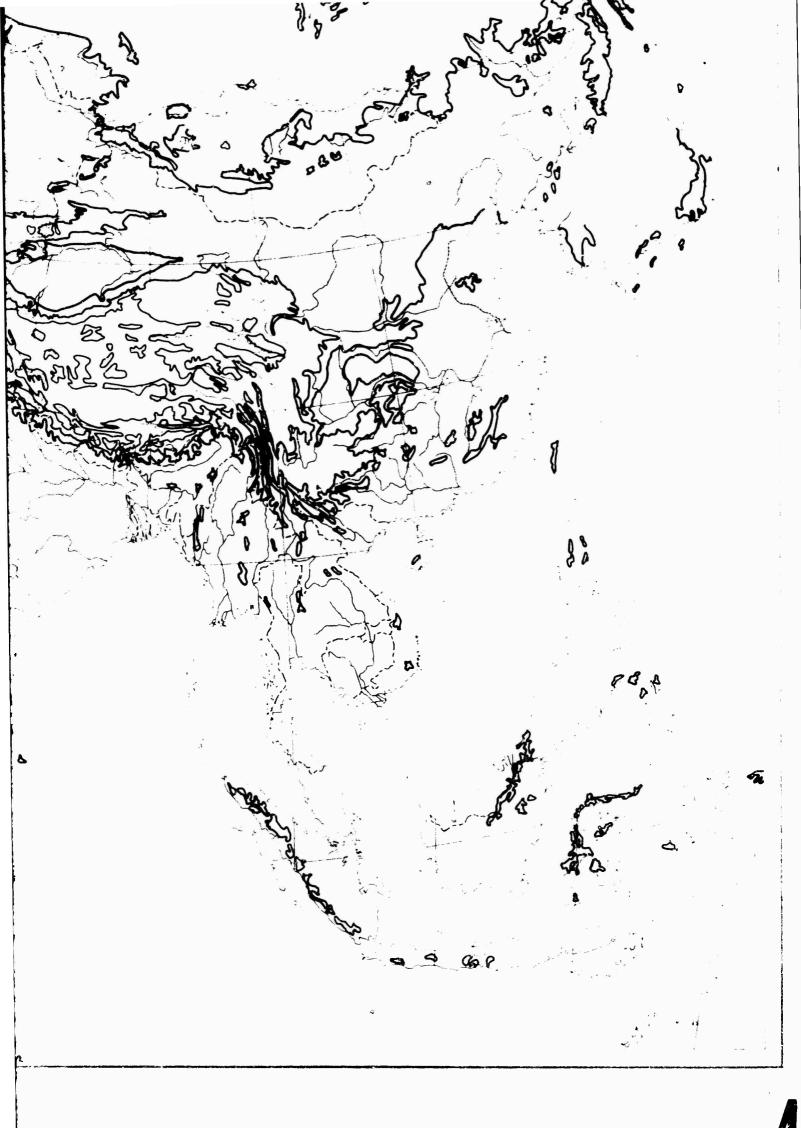


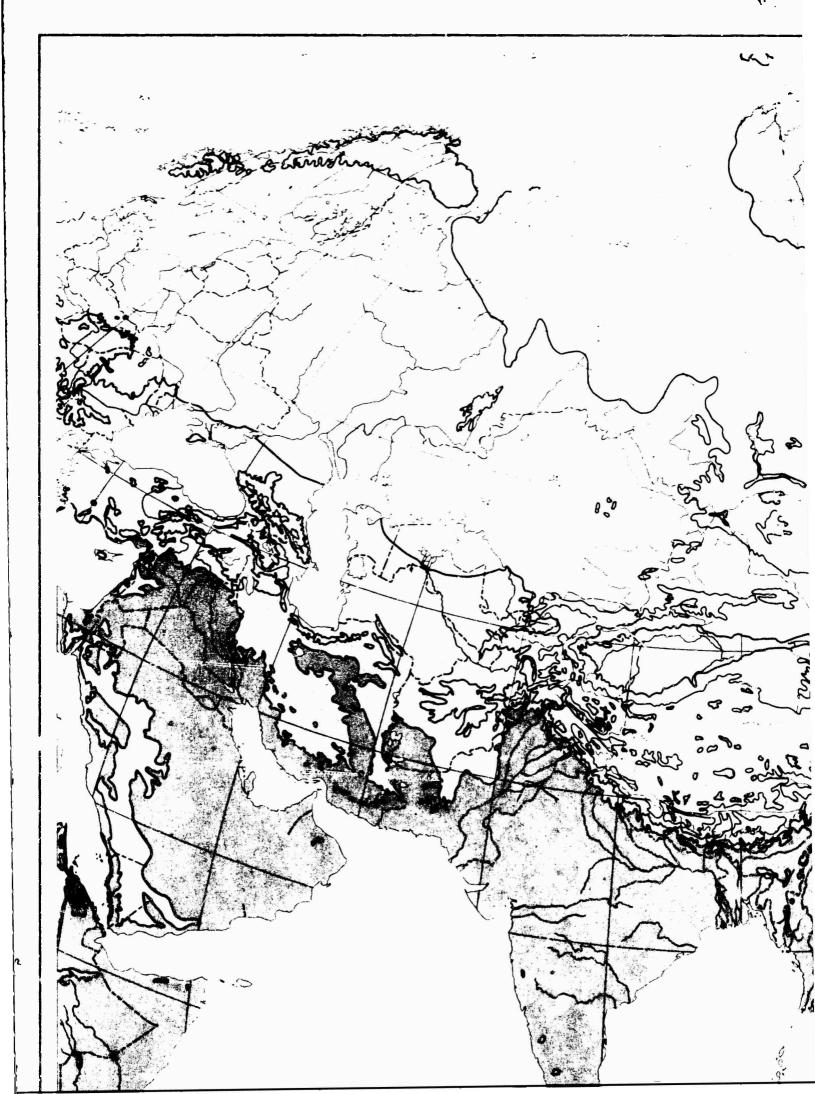




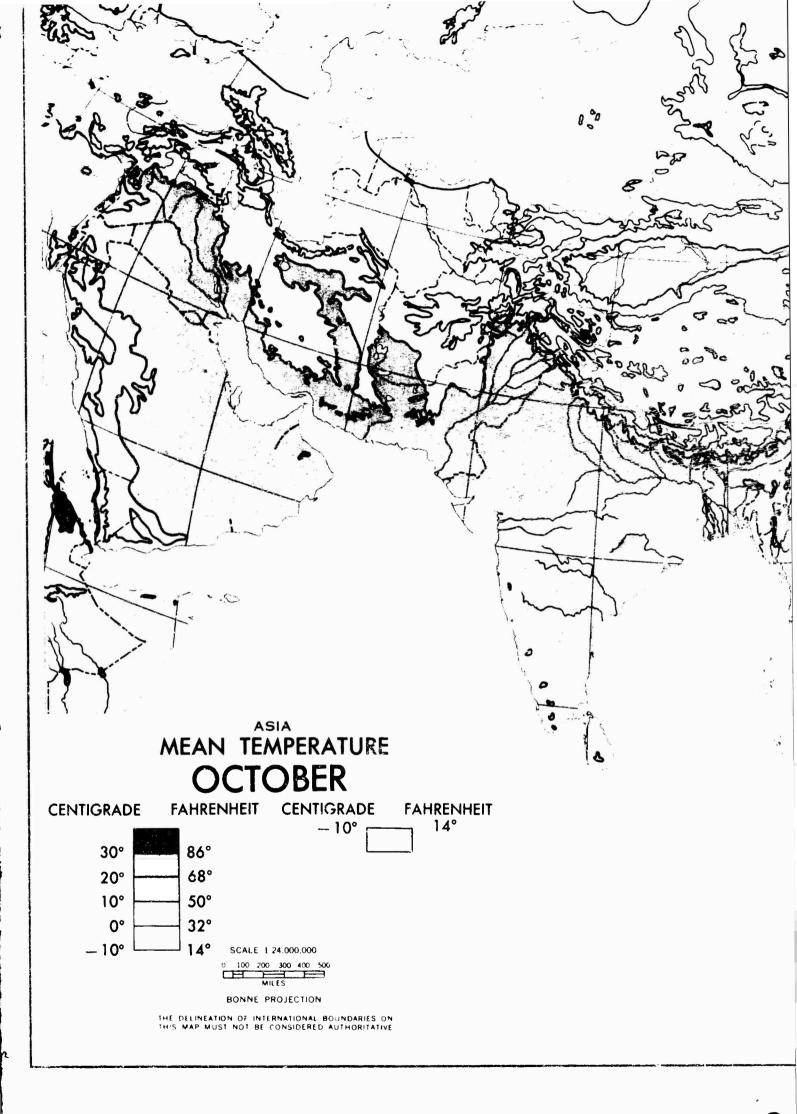


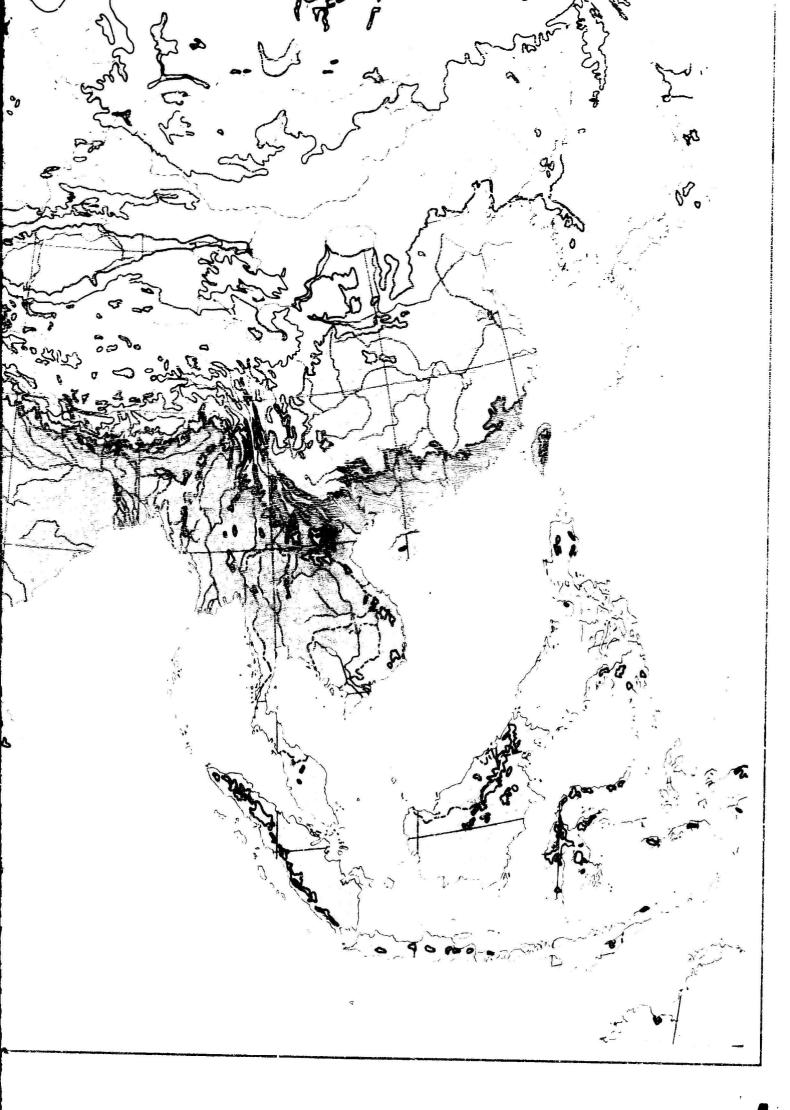




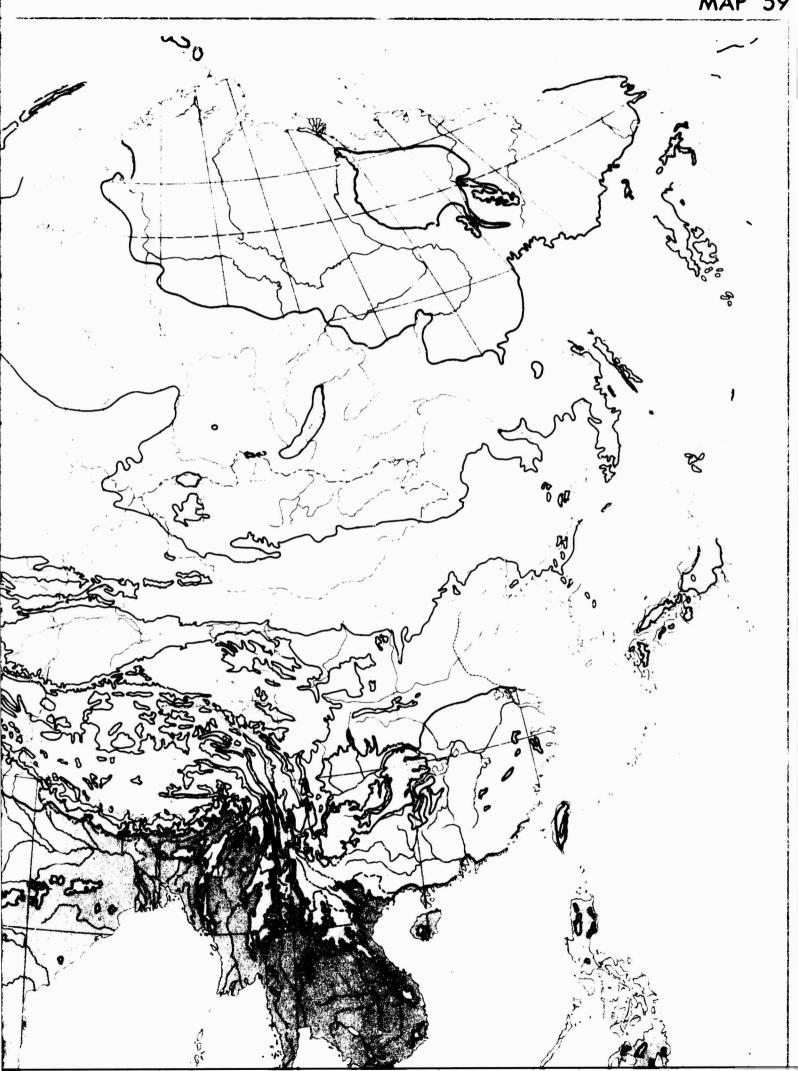


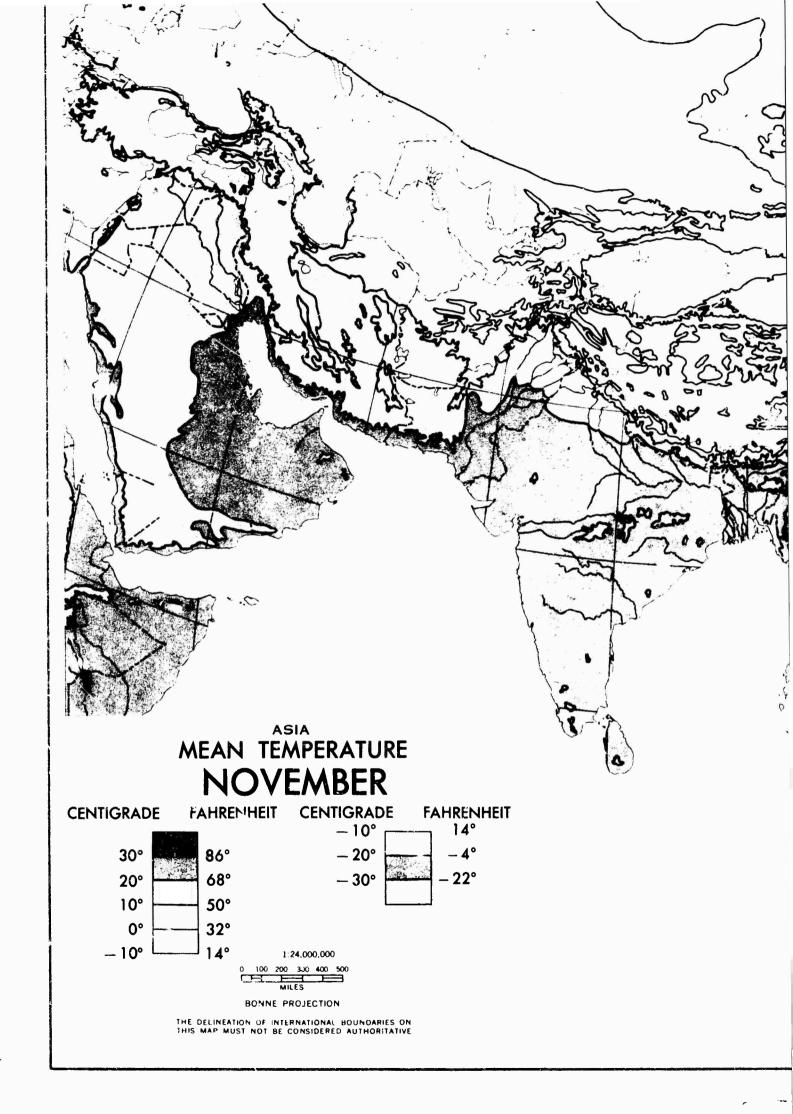


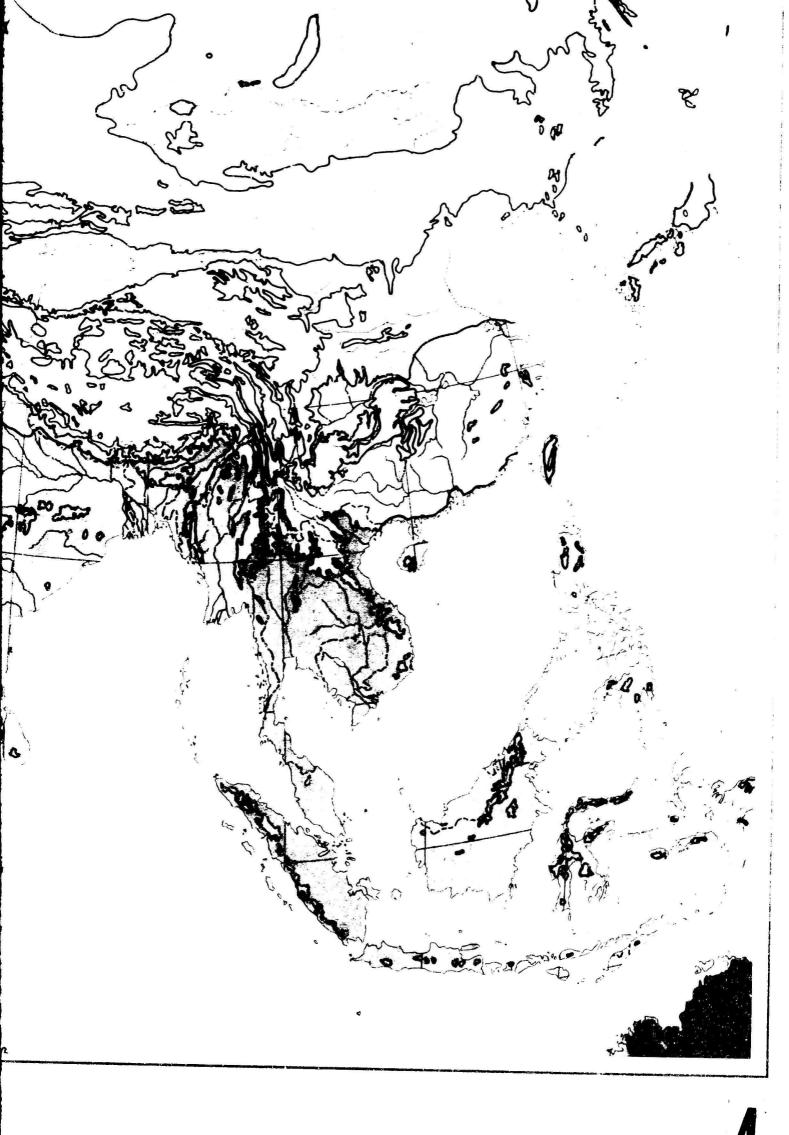


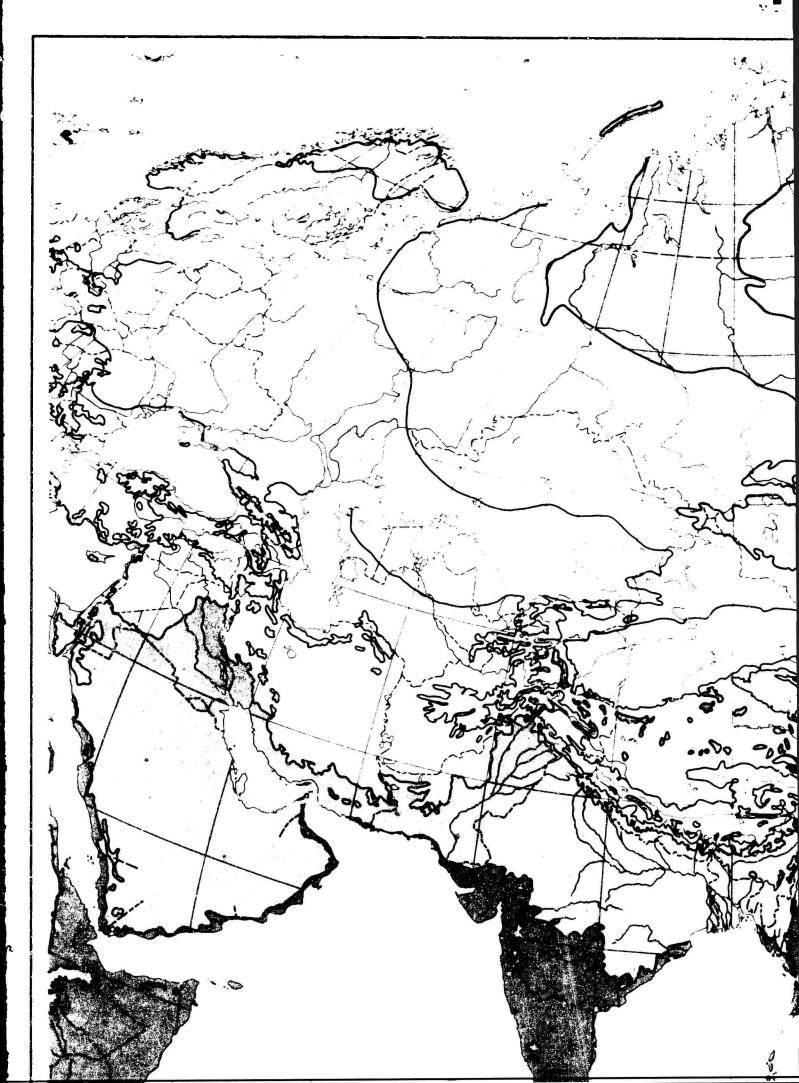


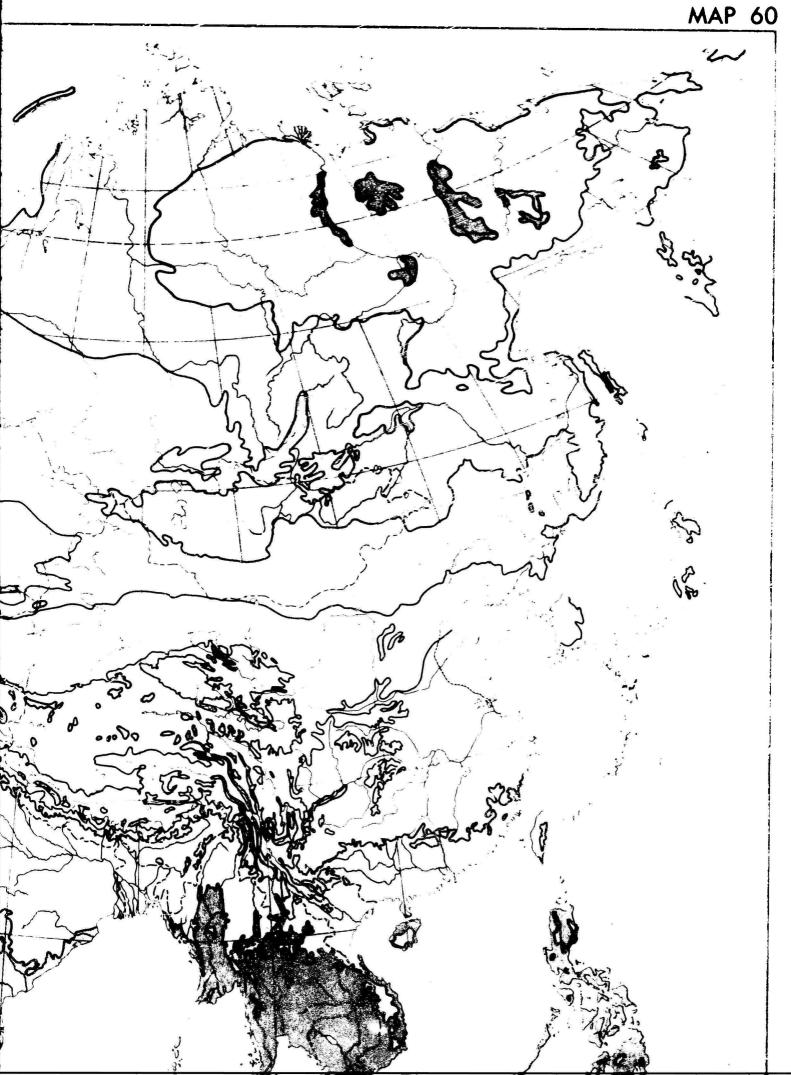
MAP 59

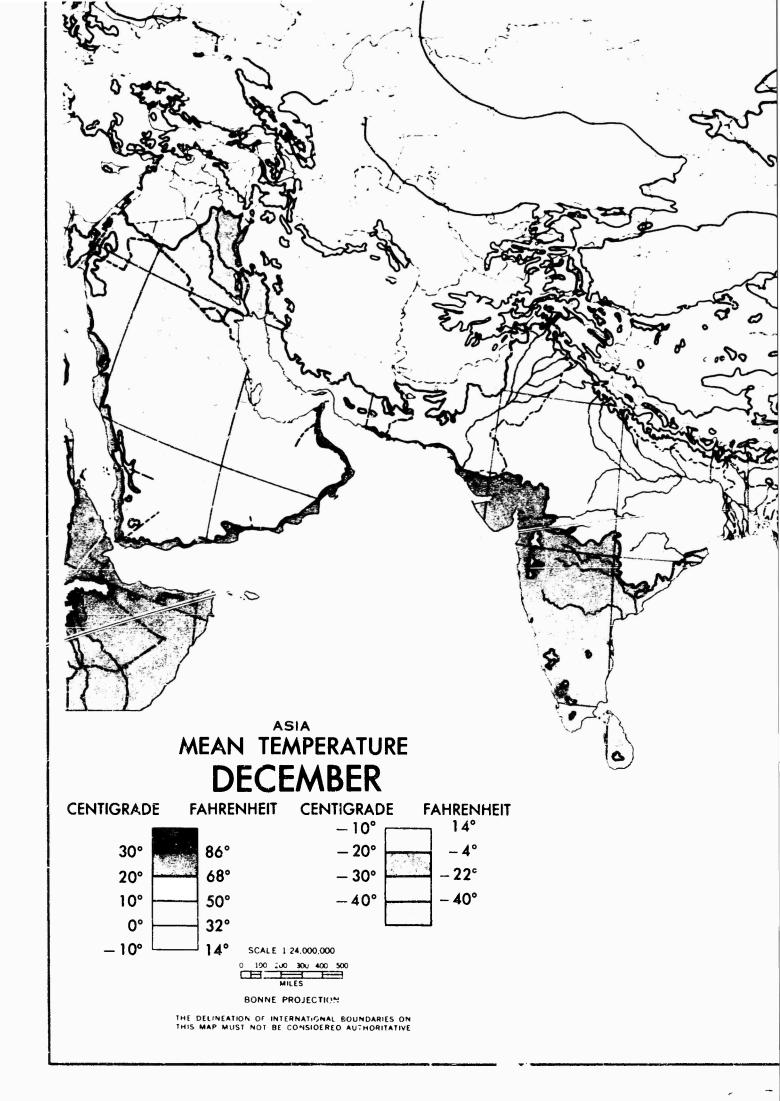


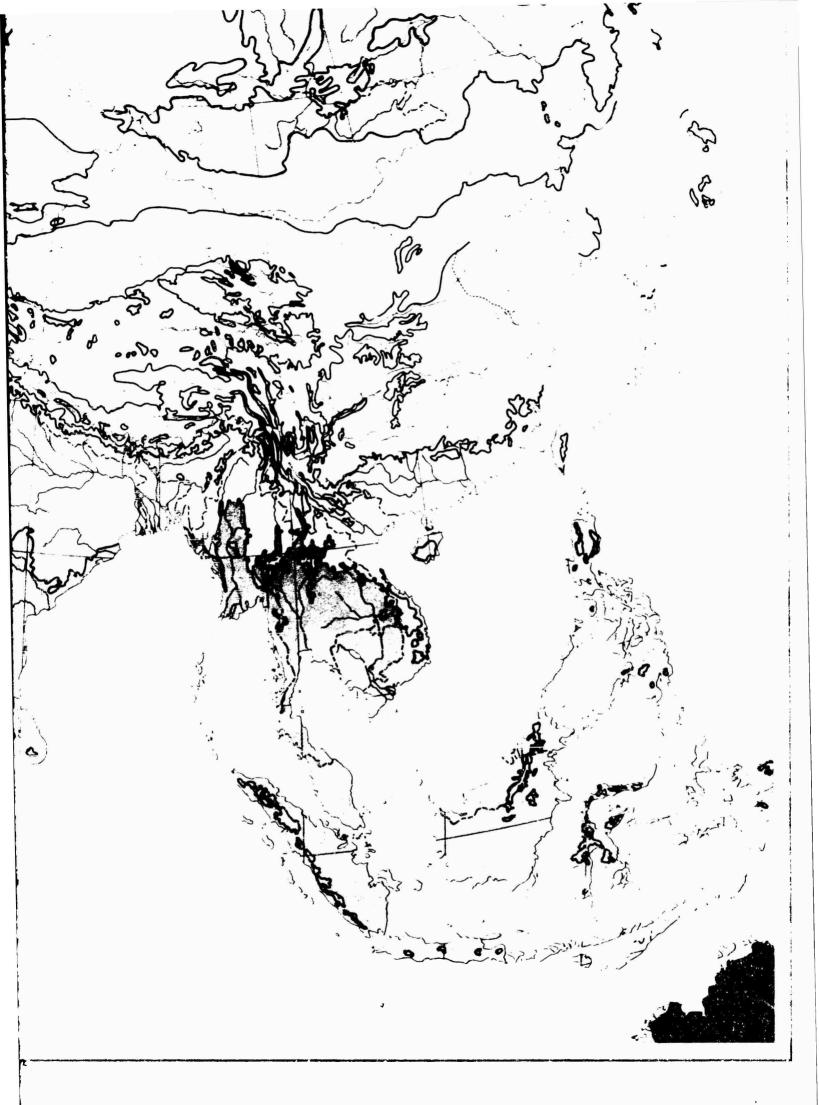




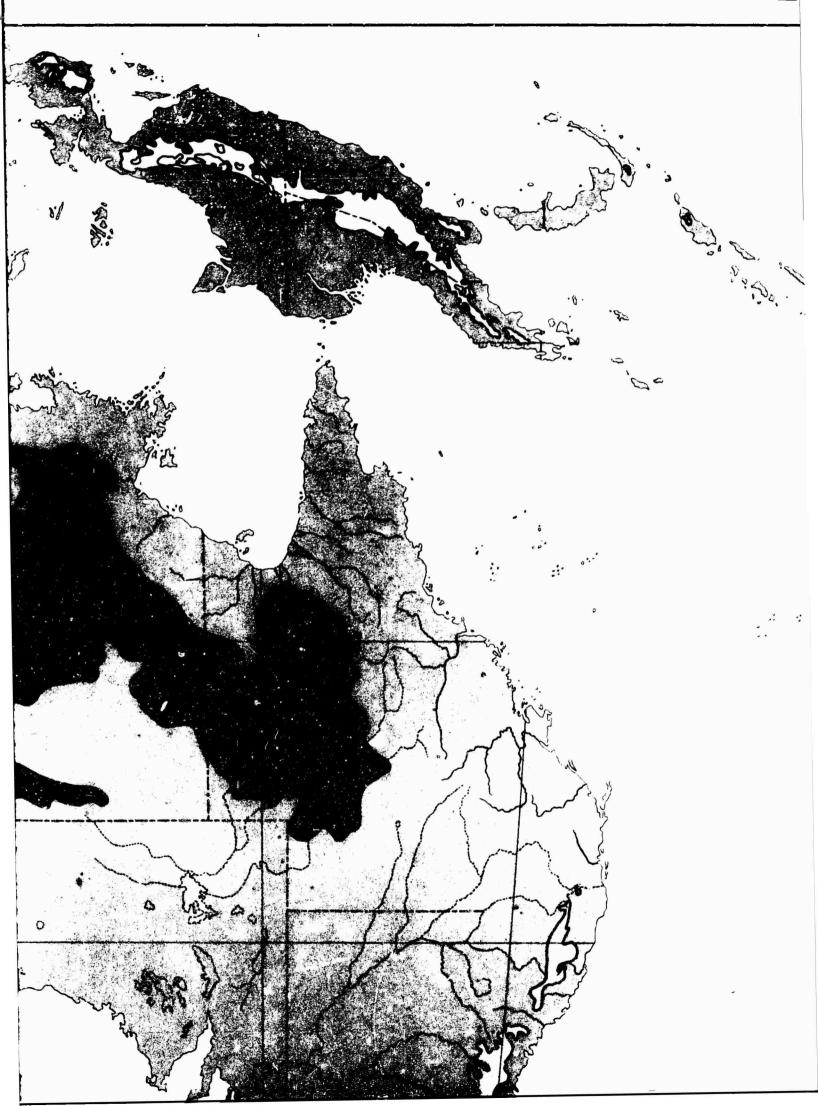


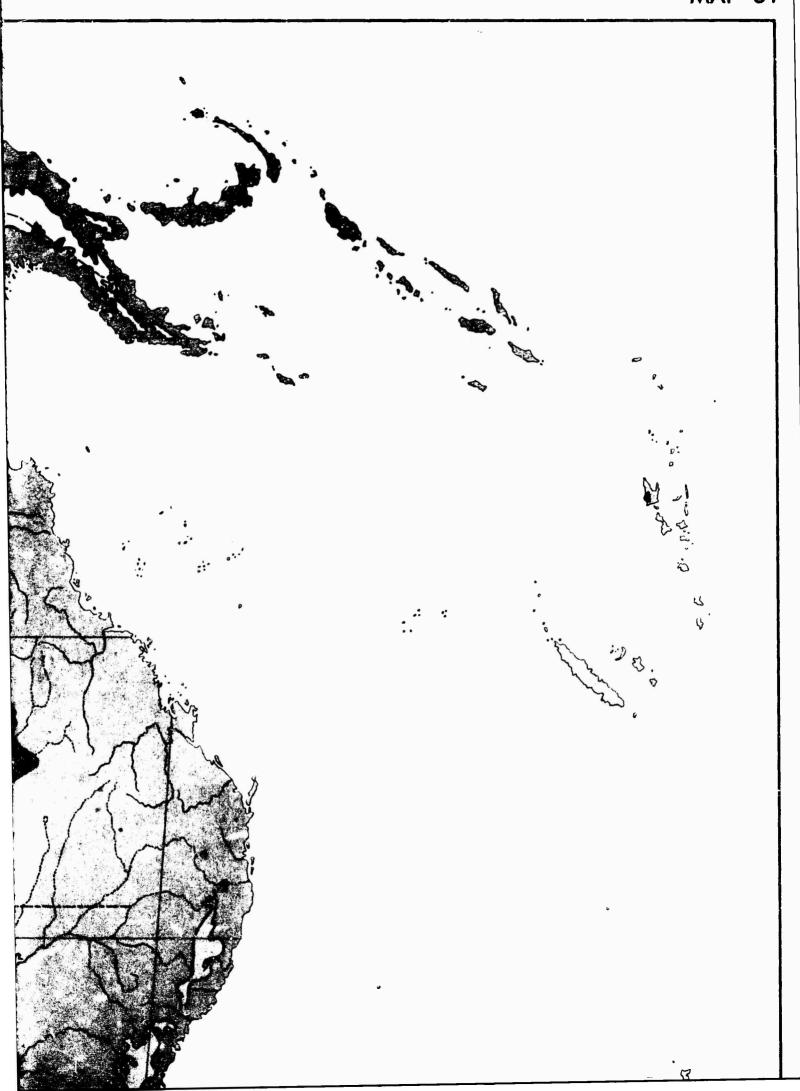








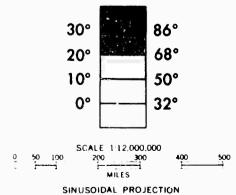


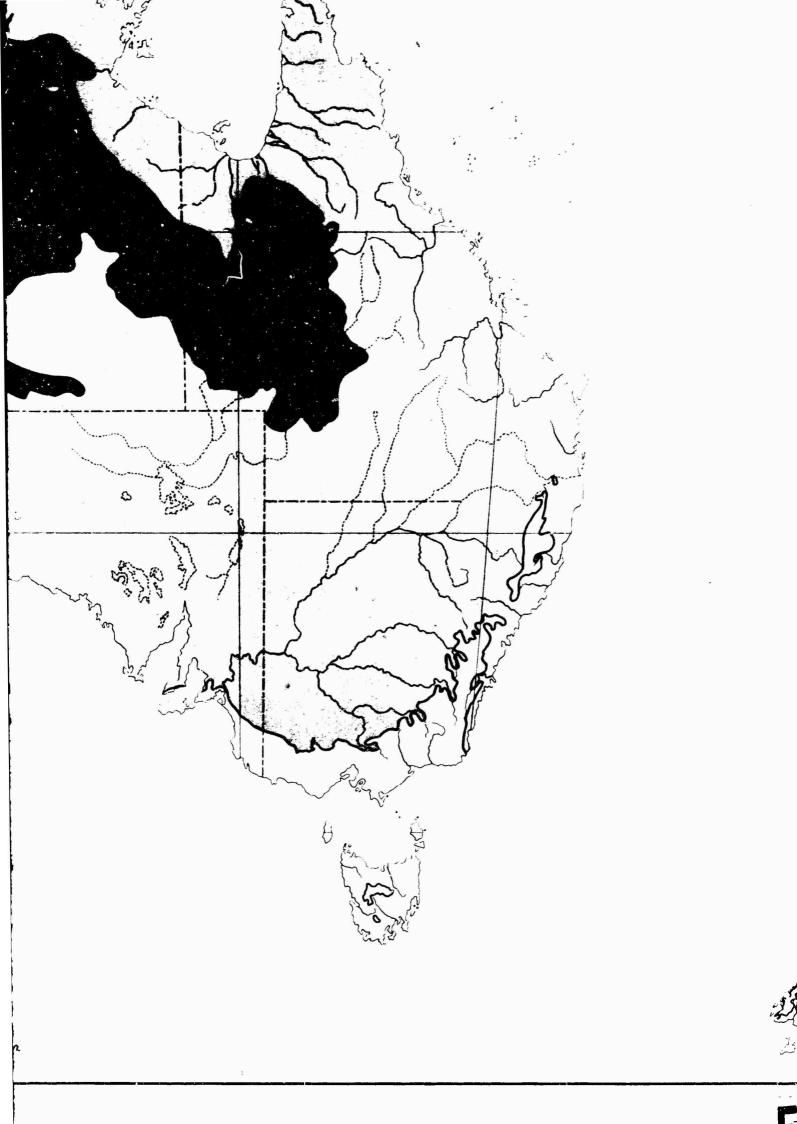


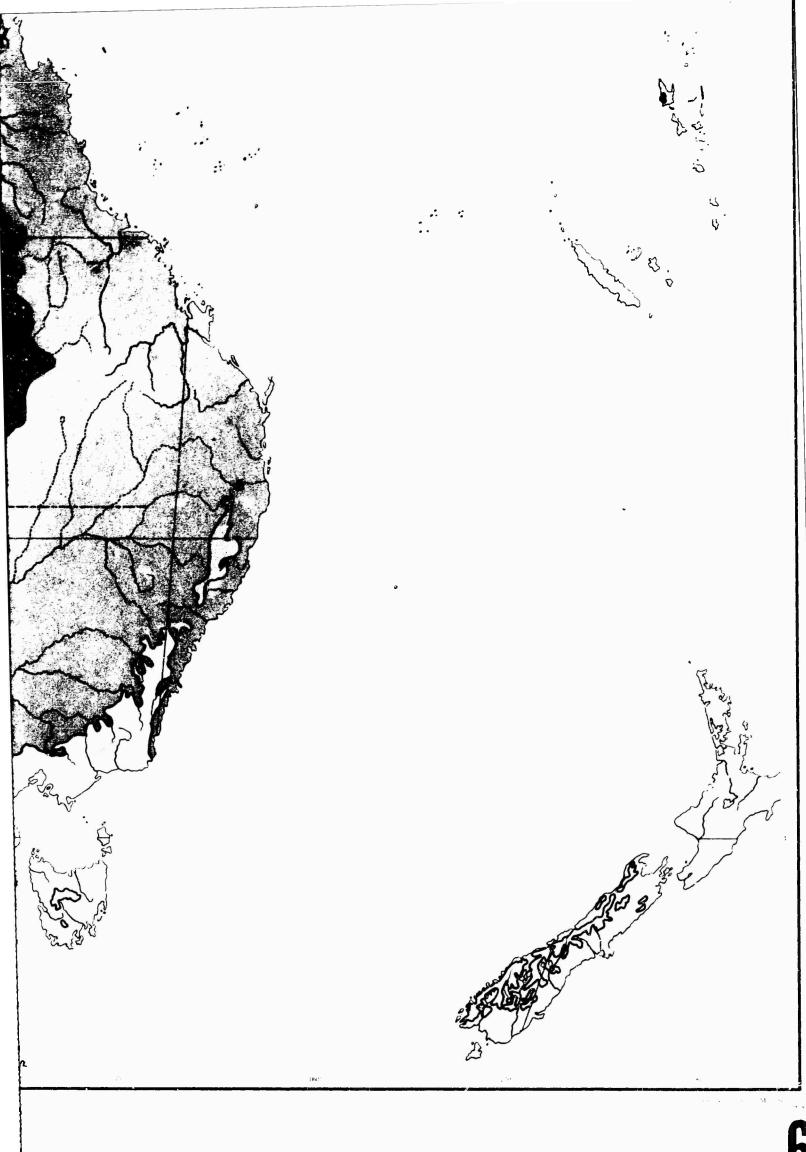


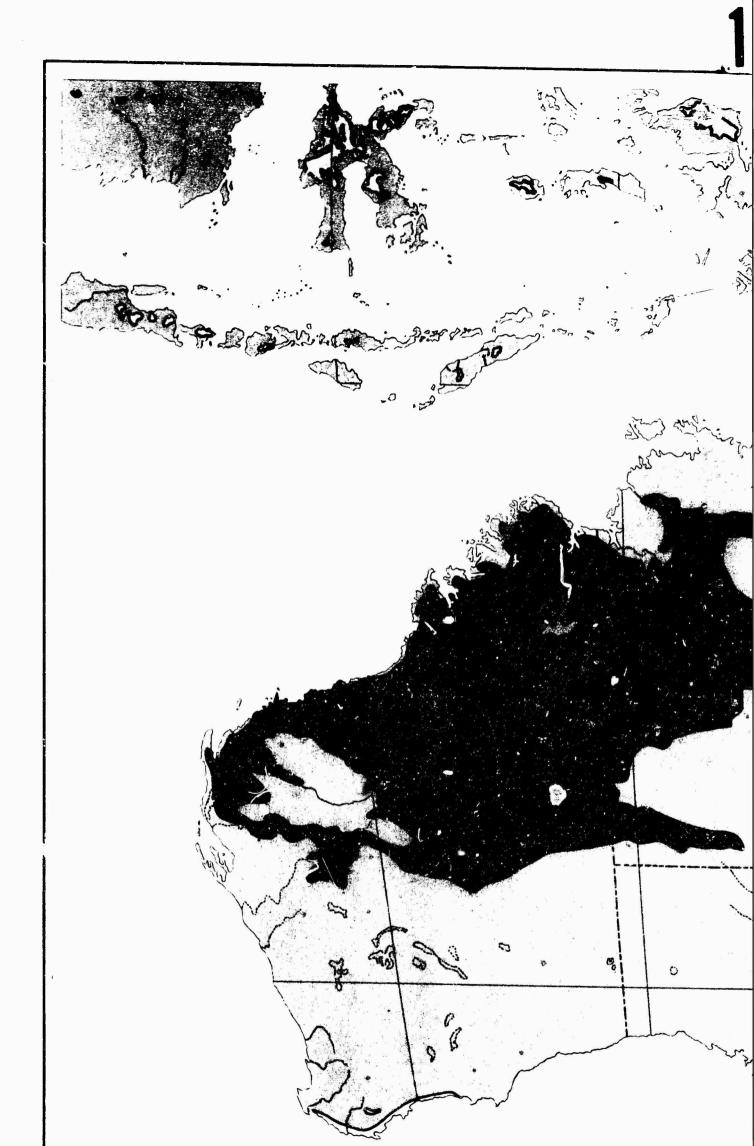
MEAN TEMPERATURE **JANUARY**

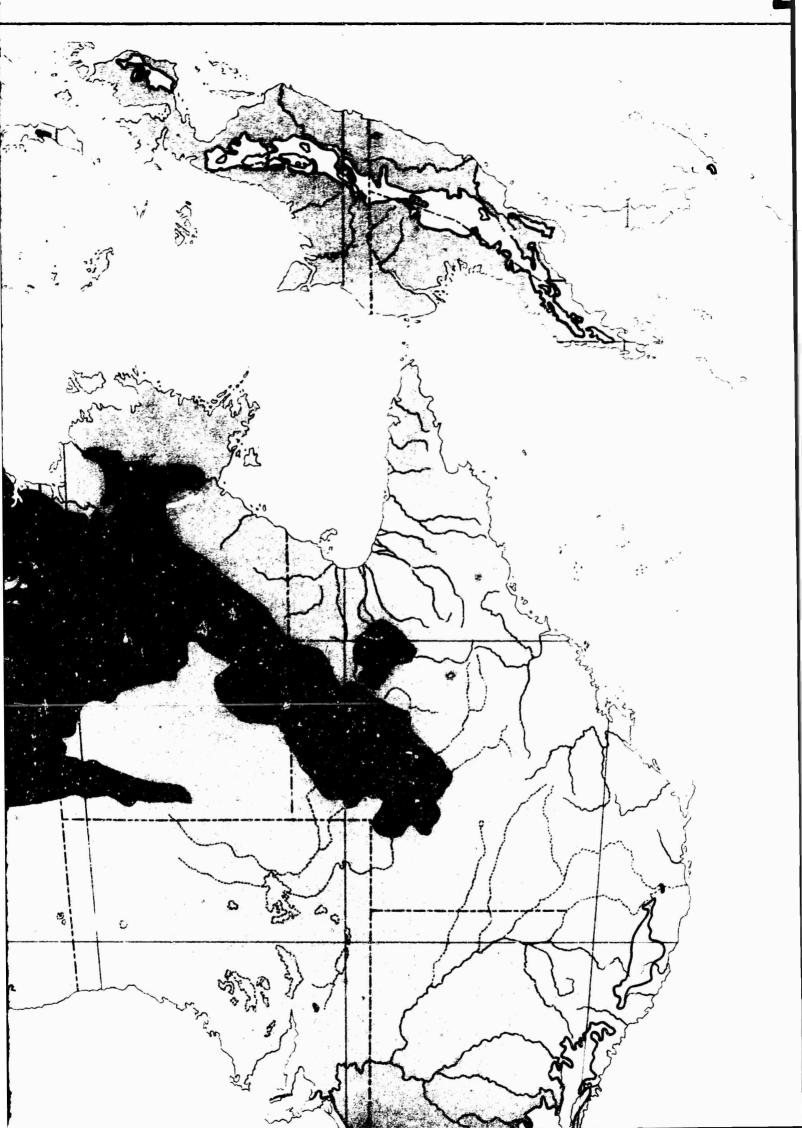
CENTIGRADE **FAHRENHEIT**

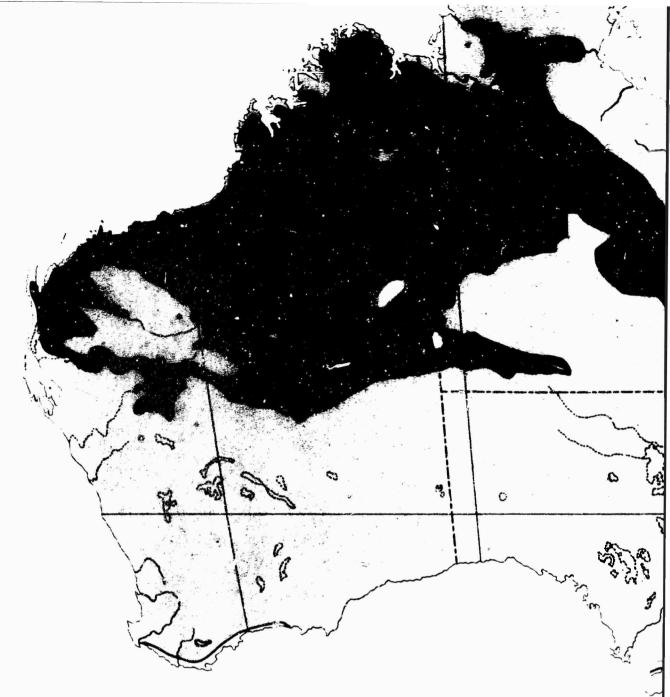






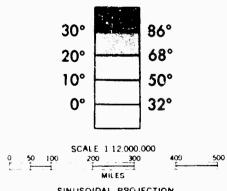




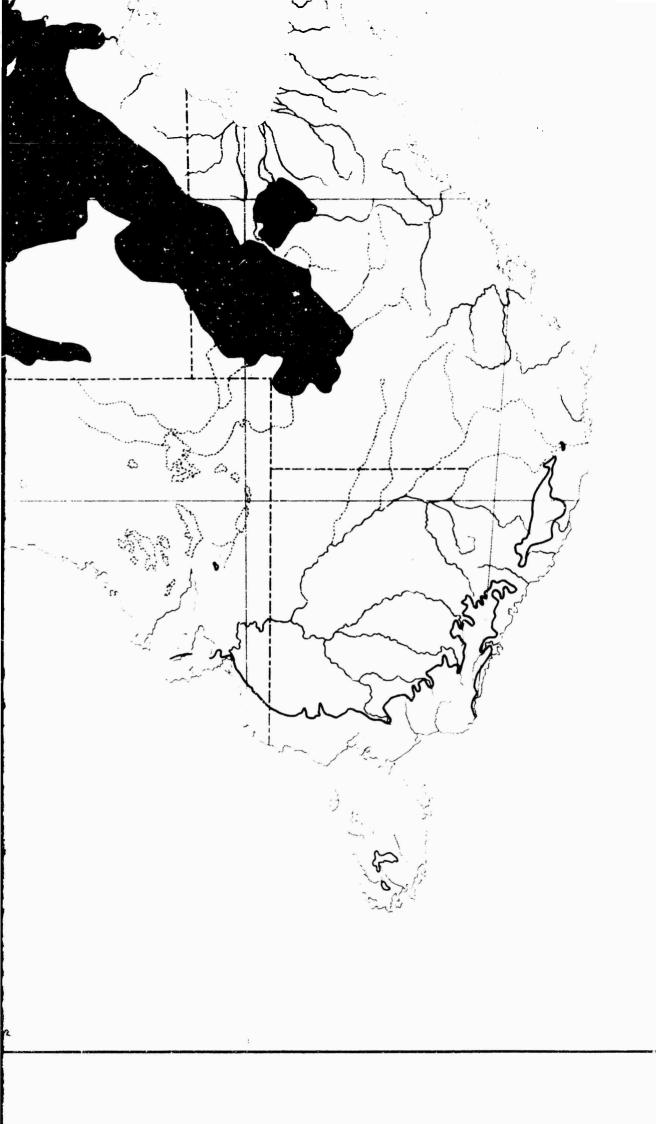


MEAN TEMPERATURE **FEBRUARY**

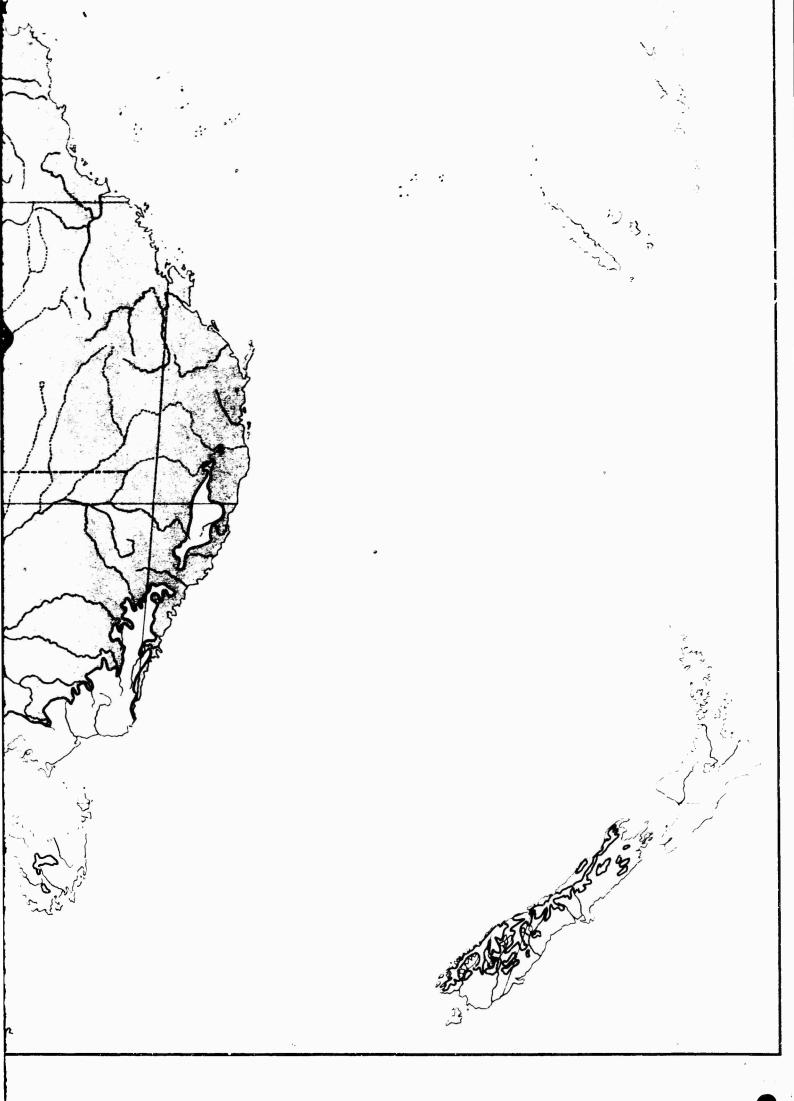
CENTIGRADE **FAHRENHEIT**

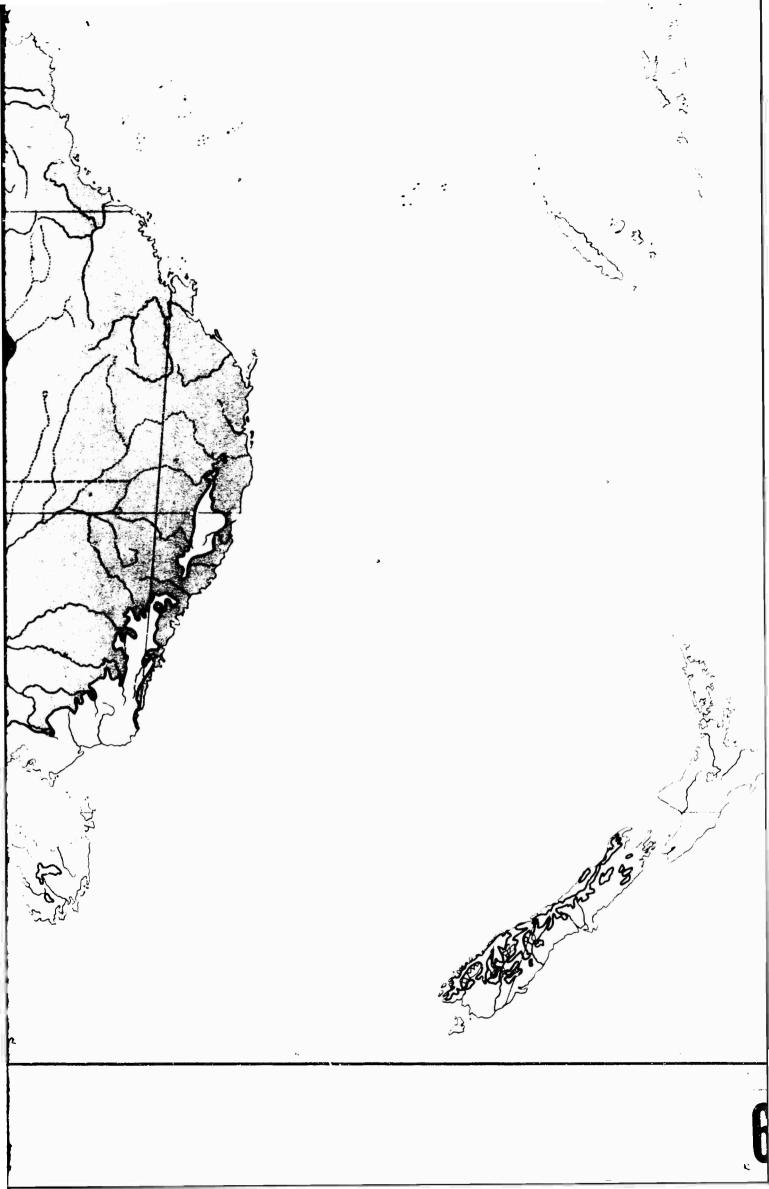


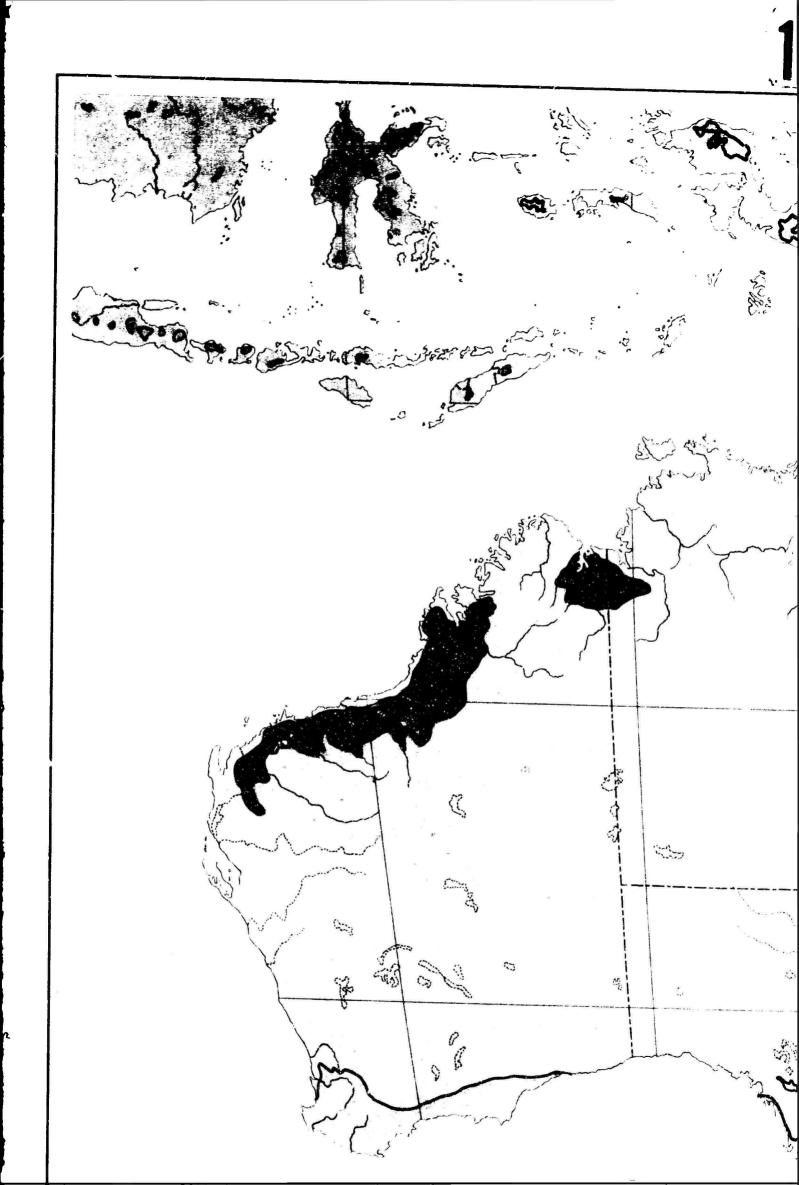
SINUSOIDAL PROJECTION

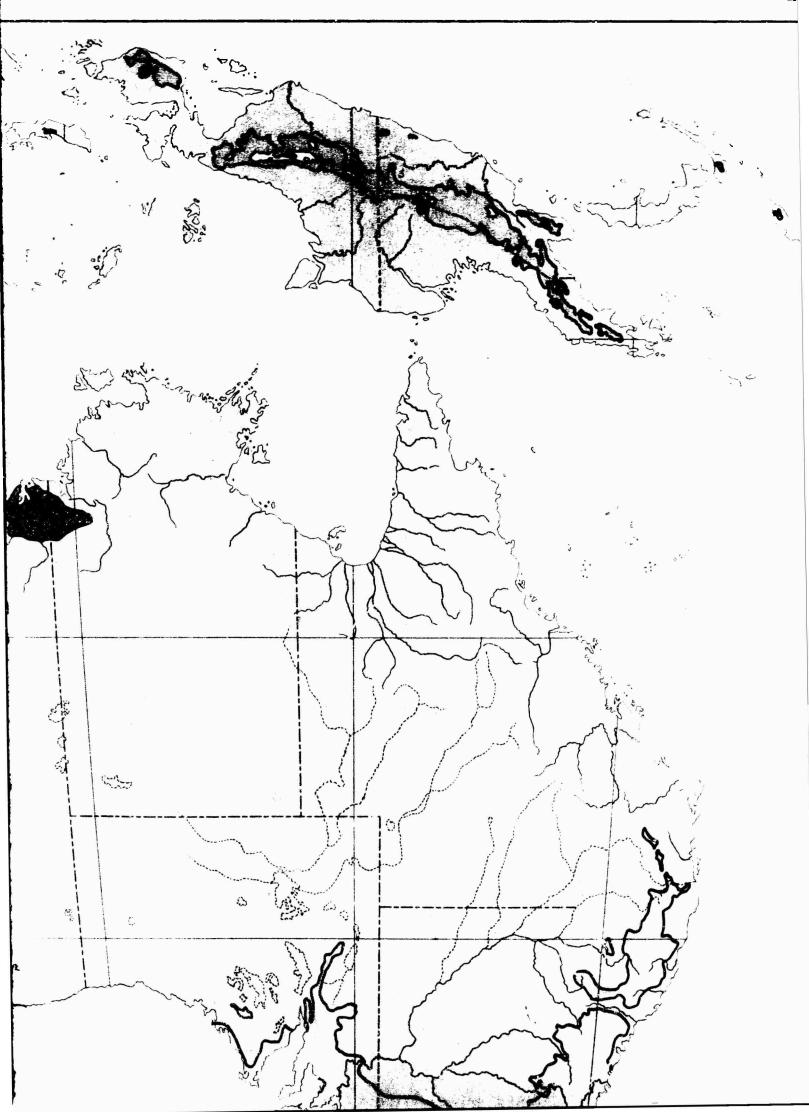


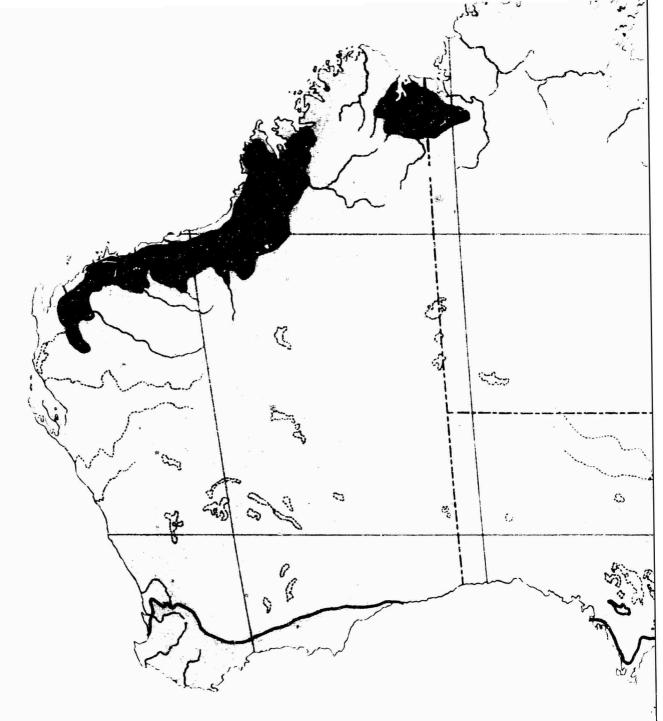
£,





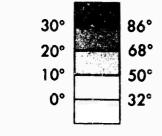






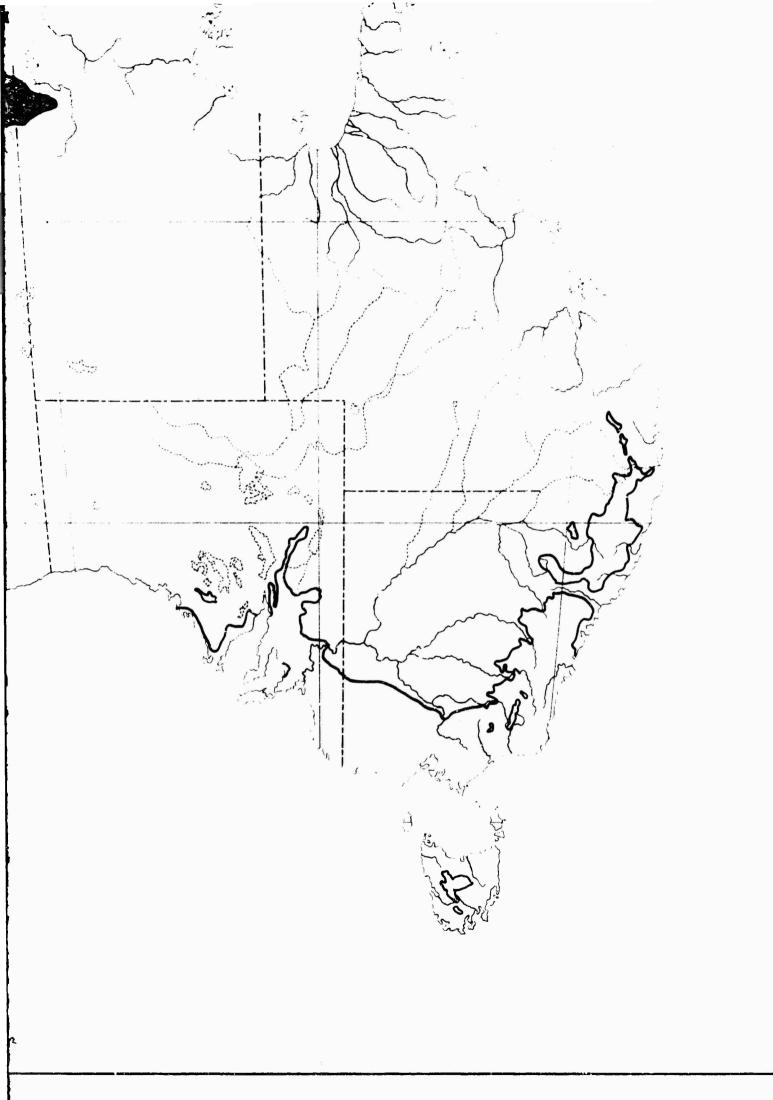
MEAN TEMPERATURE MARCH

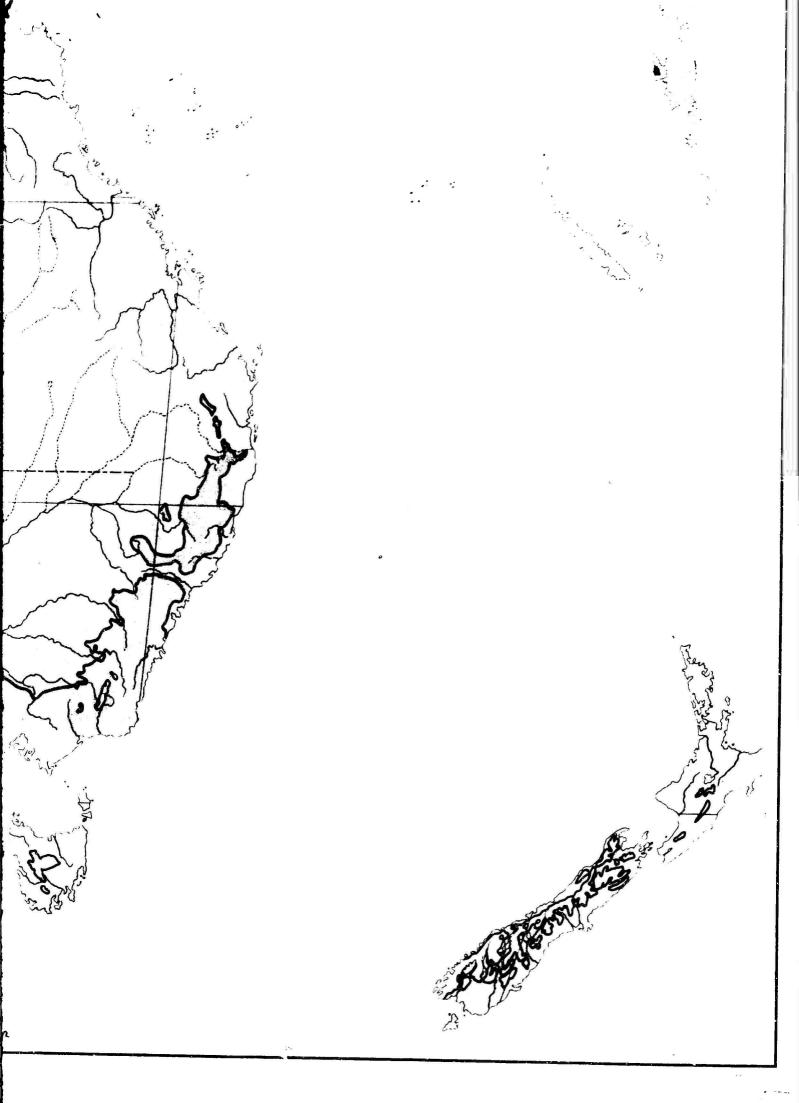
CENTIGRADE FAHRENHEIT

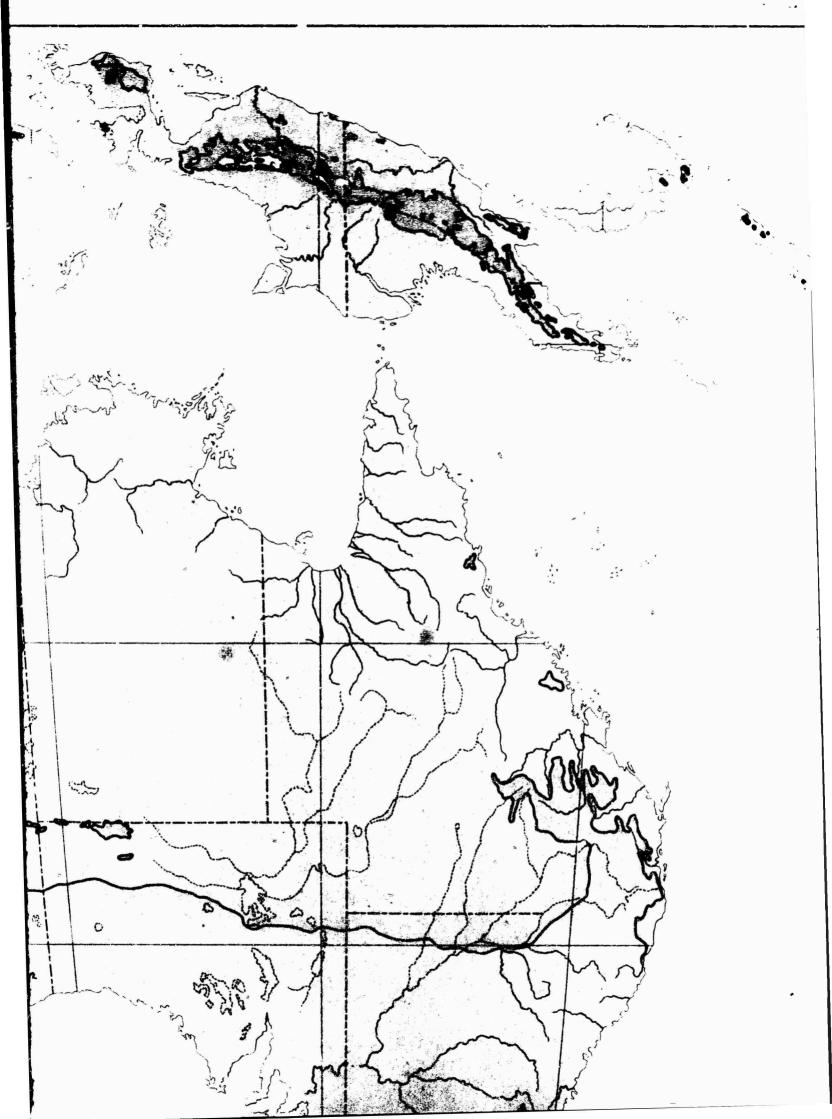


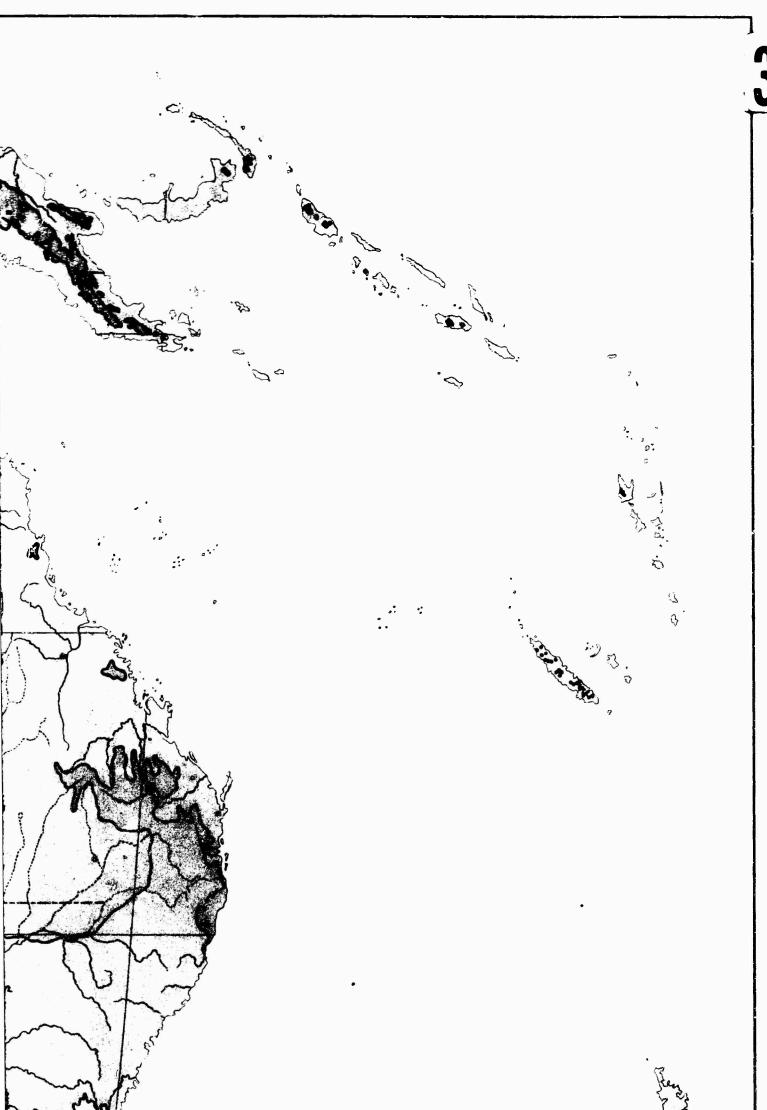


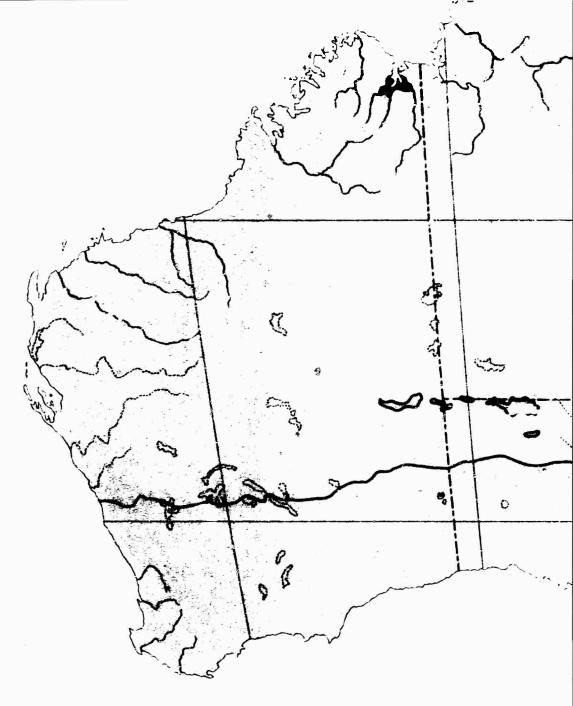
SINUSOIDAL PROJECTION





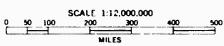




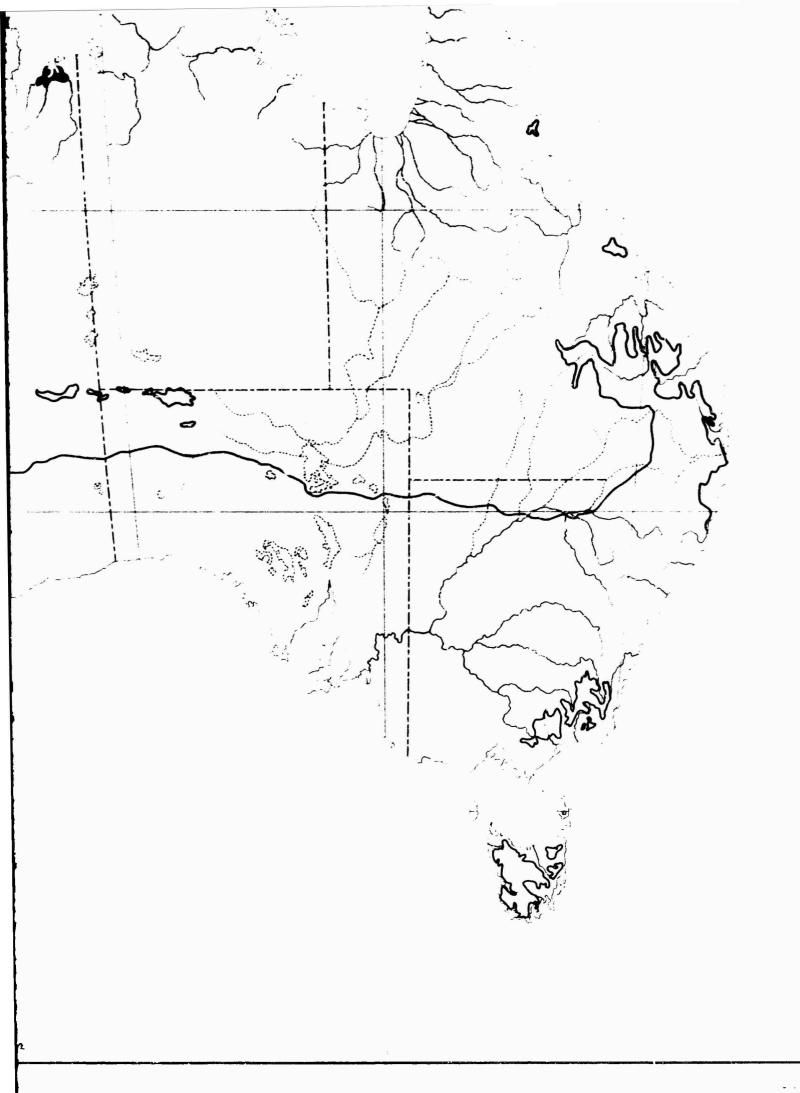


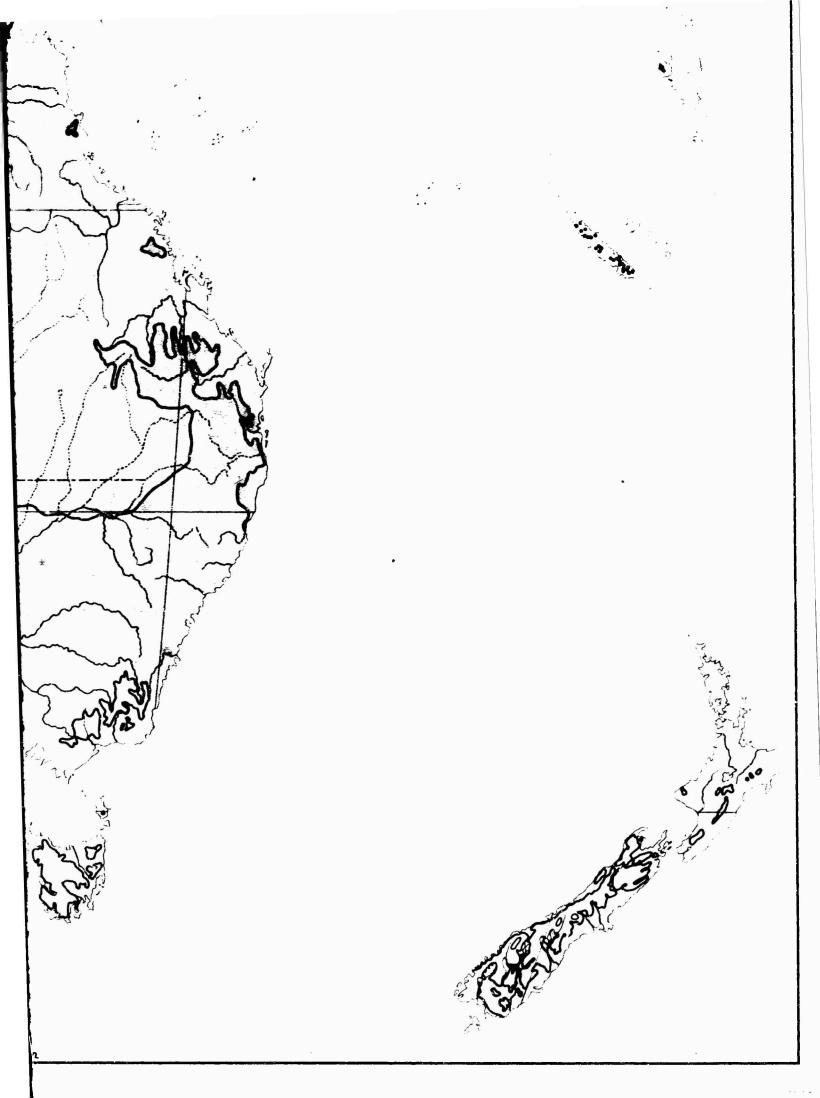
MEAN TEMPERATURE APRIL

30° 86° 68° 10° 0° 32°

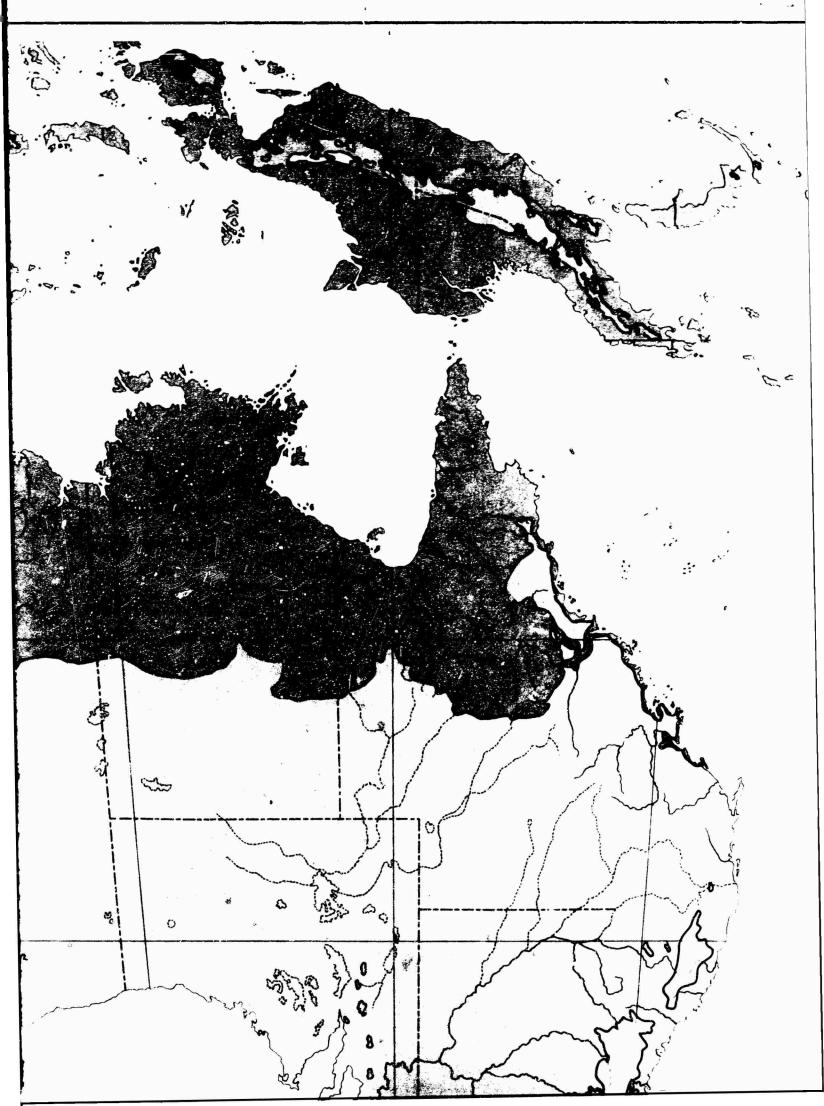


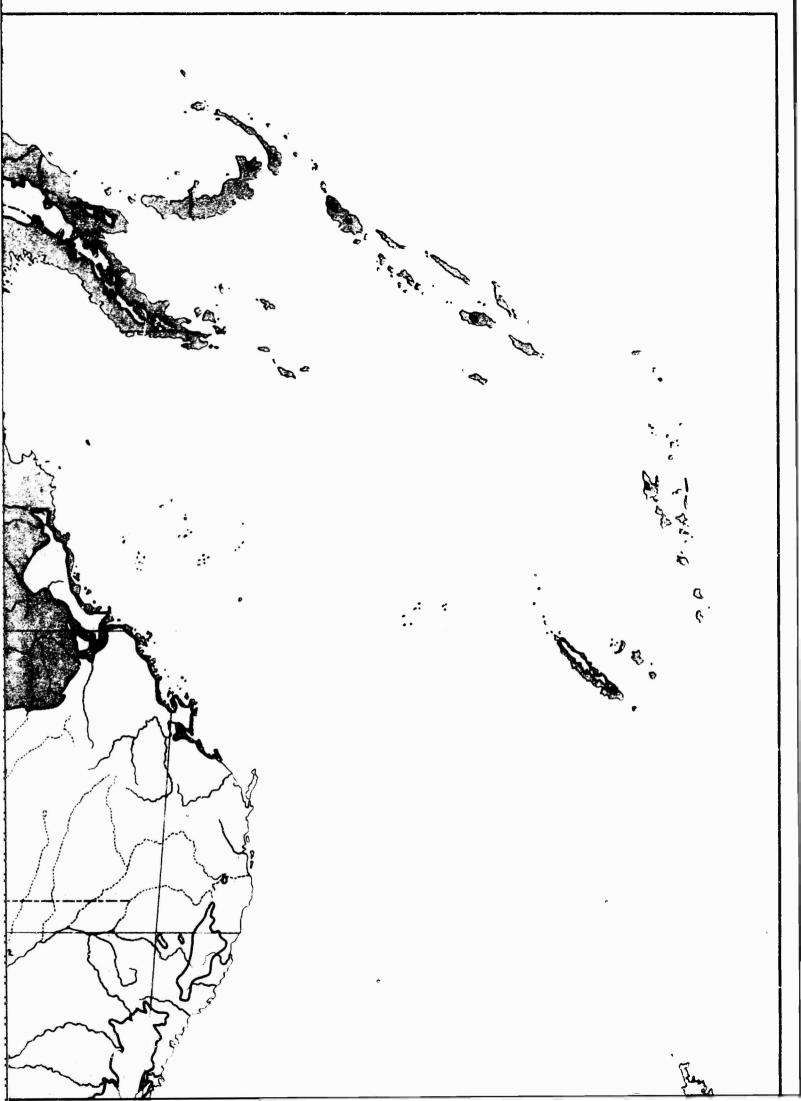
SINUSOIDAL PROJECTION

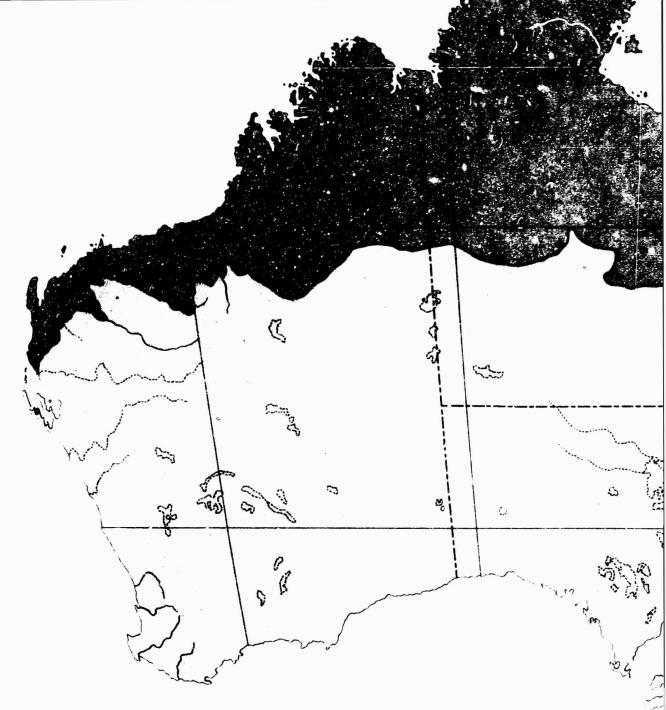




1

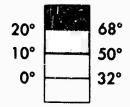


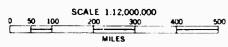




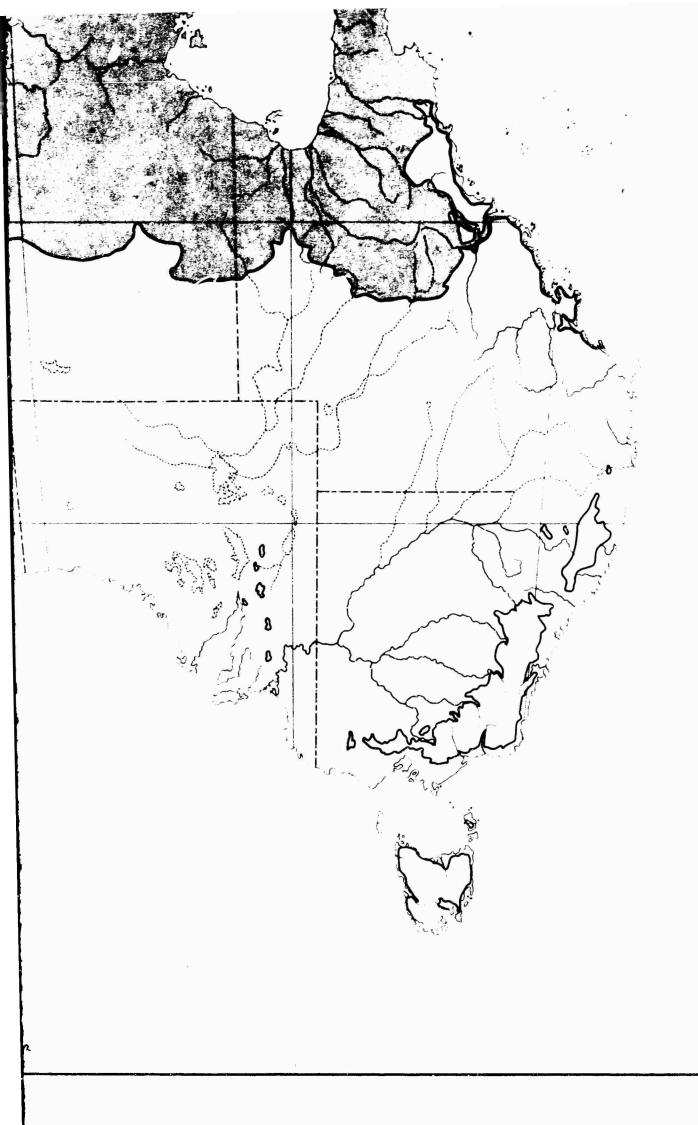
MEAN TEMPERATURE MAY

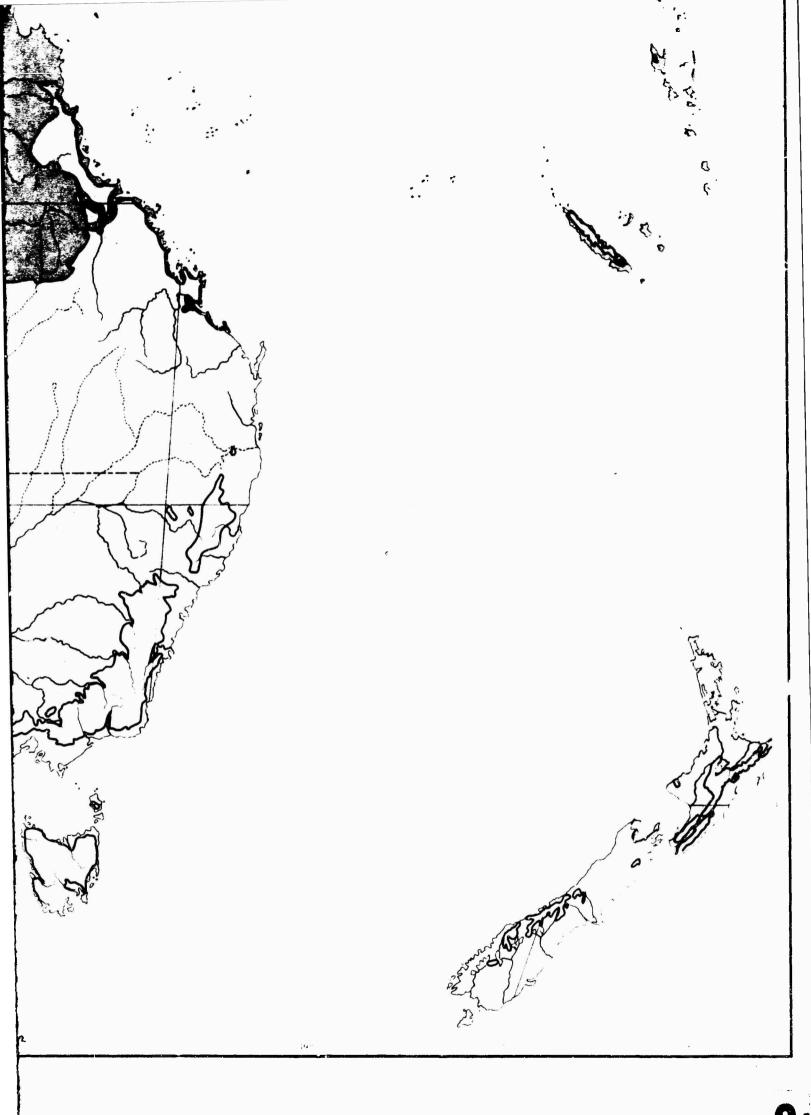
CENTIGRADE FAHRENHEIT

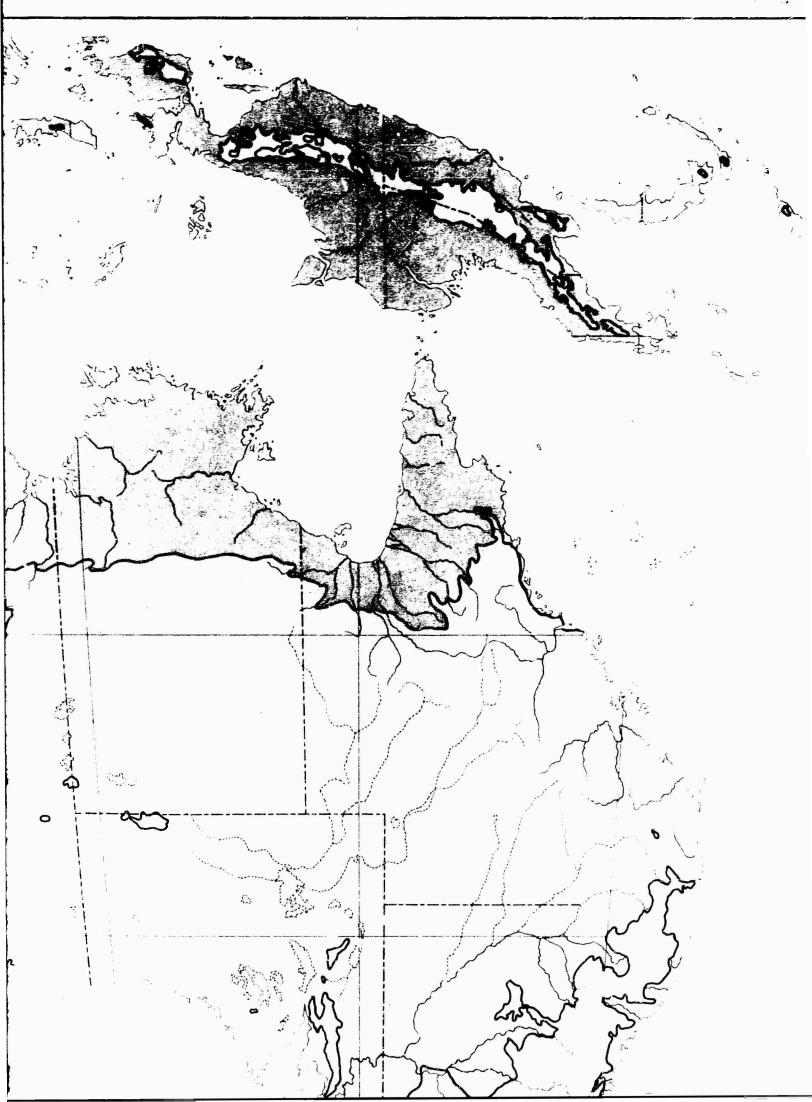


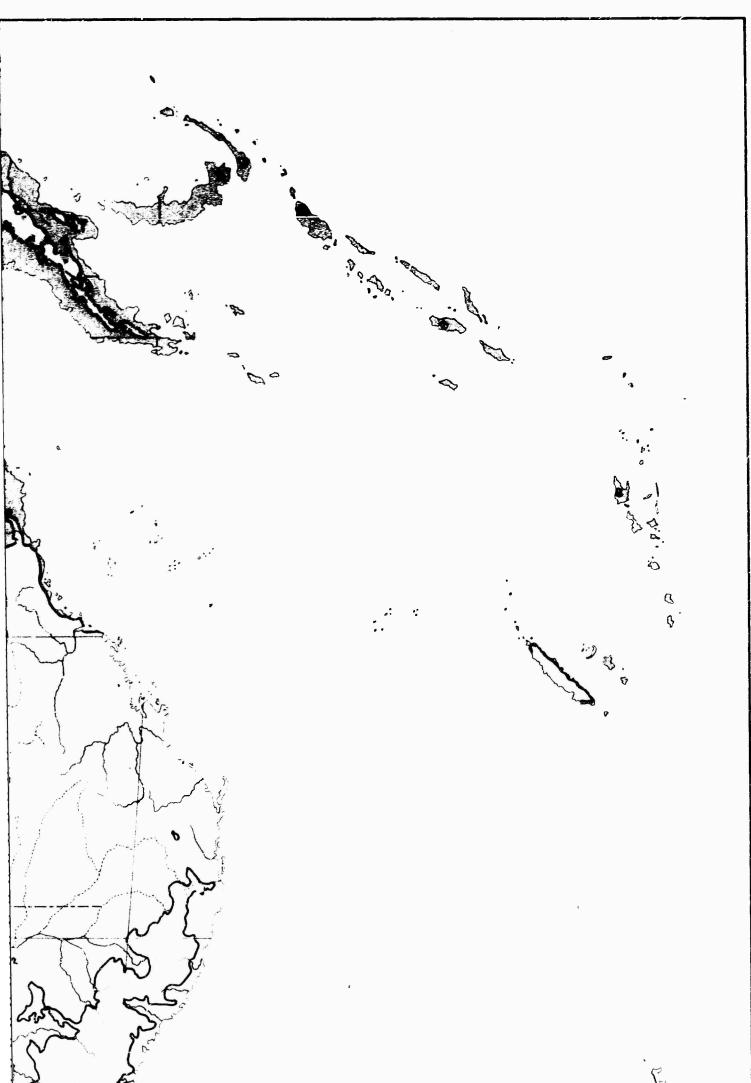


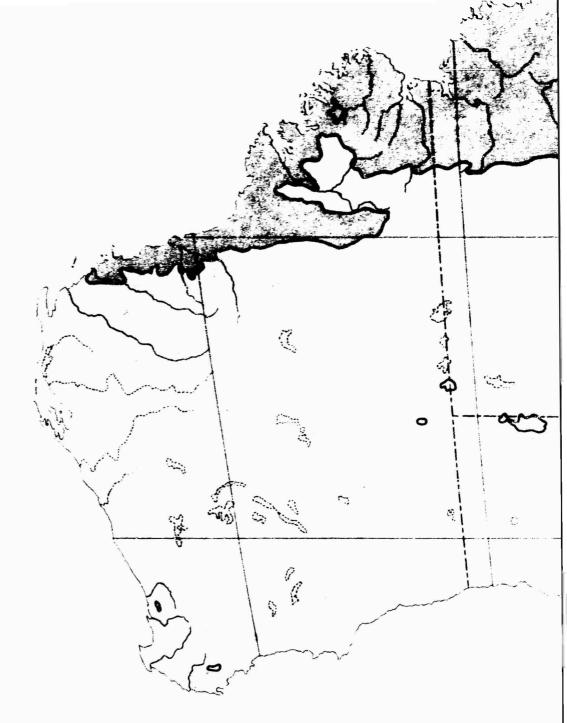
SINUSOIDAL PROJECTION







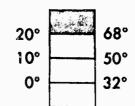


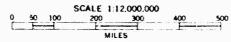


(

MEAN TEMPERATURE JUNE

CENTIGRADE FAHRENHEIT

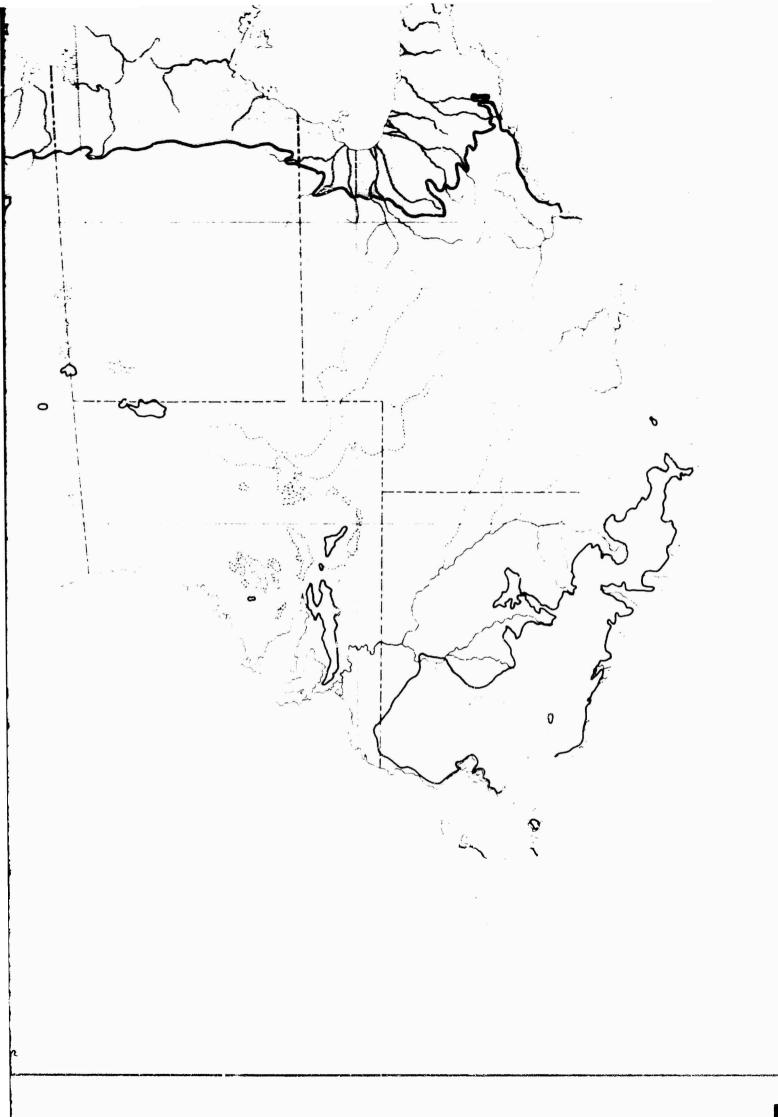


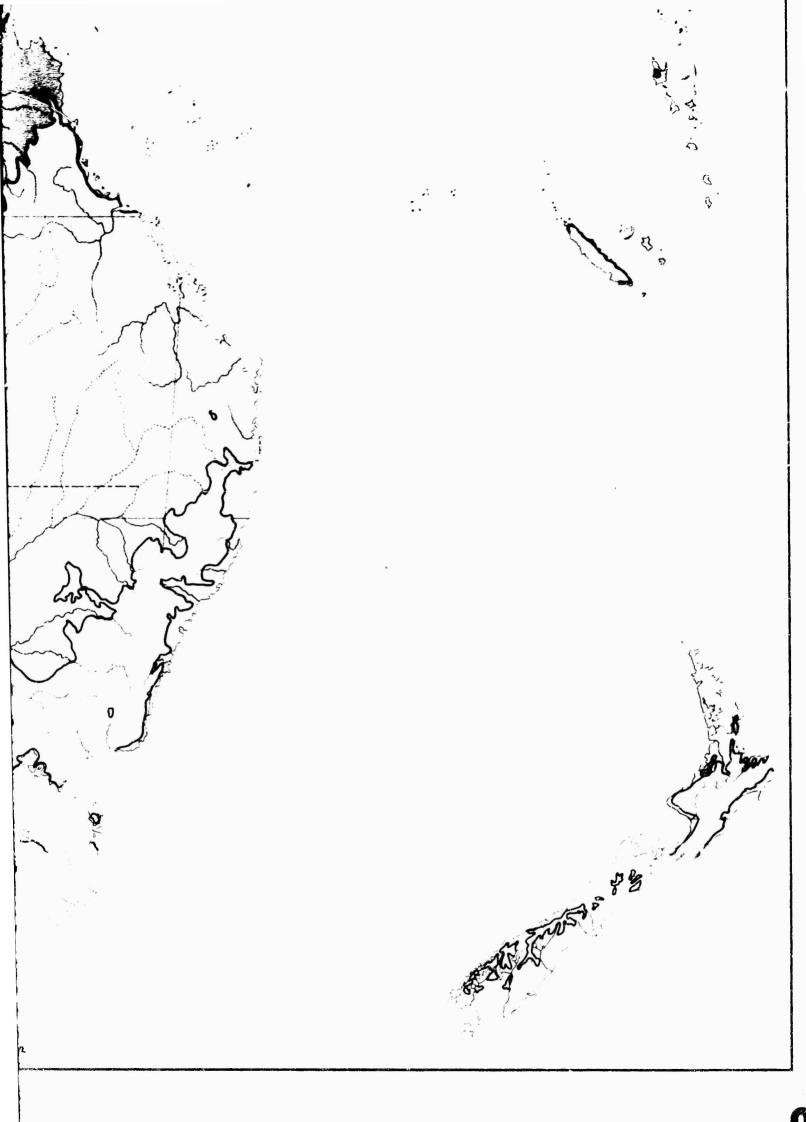


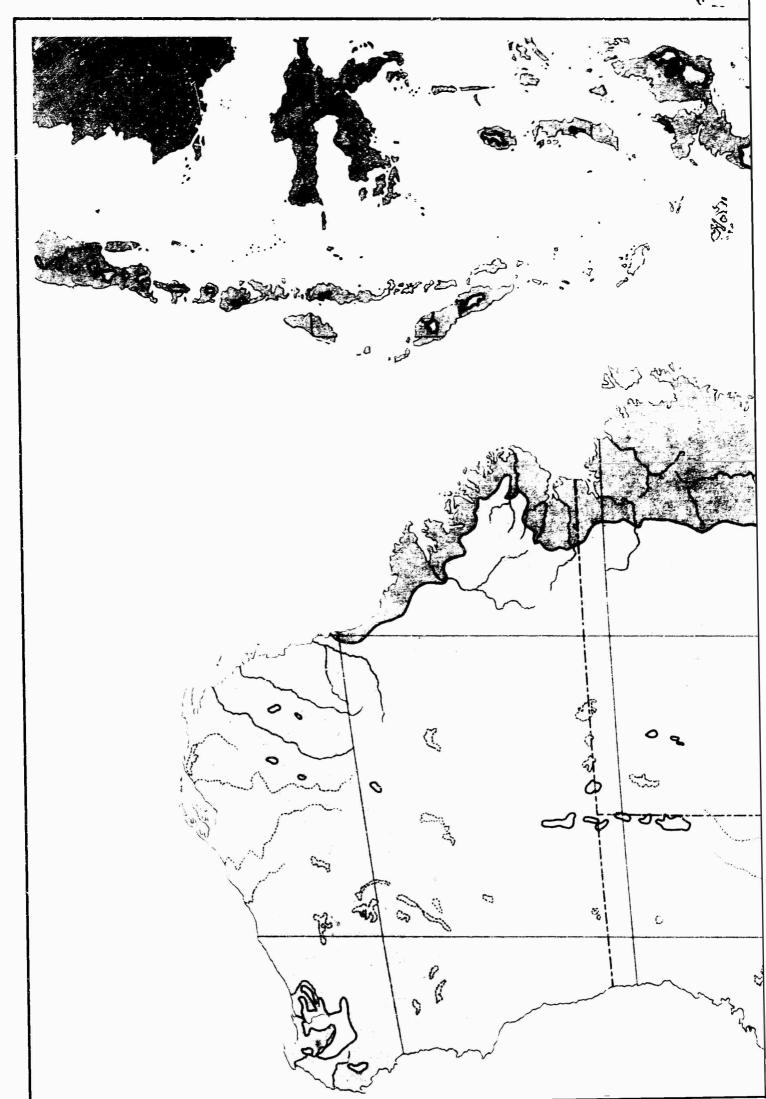
SINUSCIDAL PROJECTION

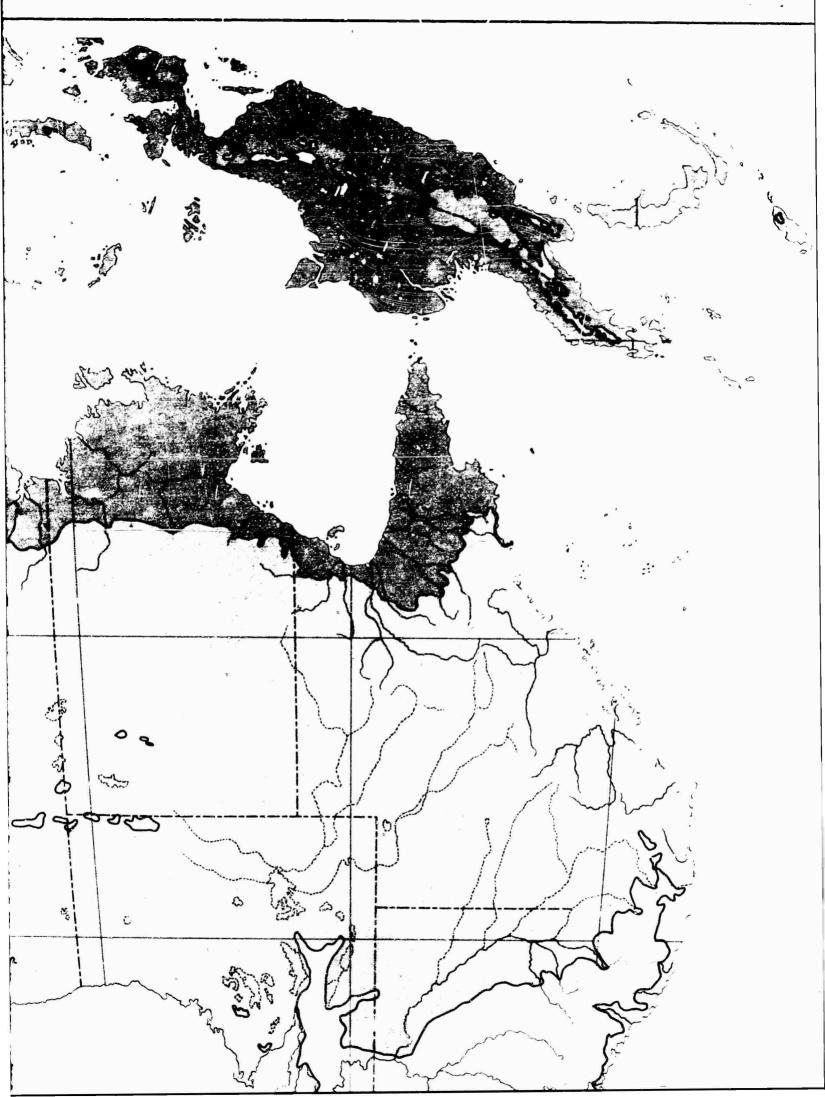
THE DELINEATION OF INTERNATIONAL BOUNDARIES ON THIS MAP MUST NOT BE CONSIDERED AUTHORITATIVE

4

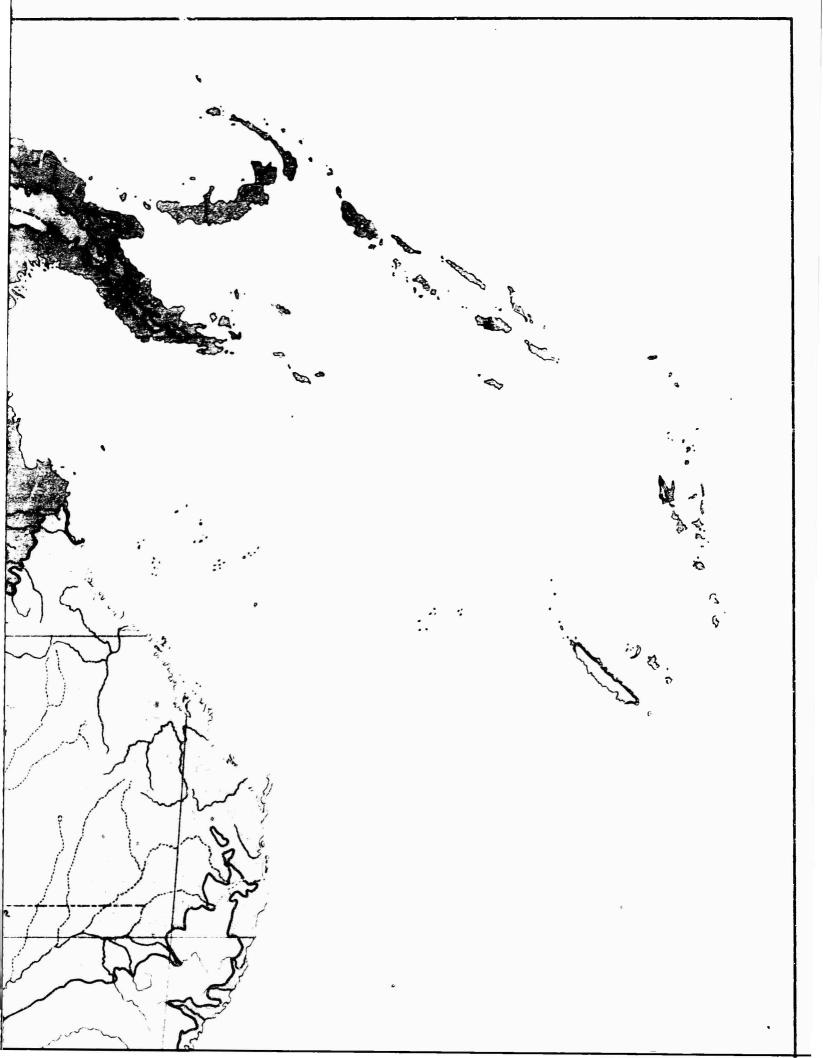


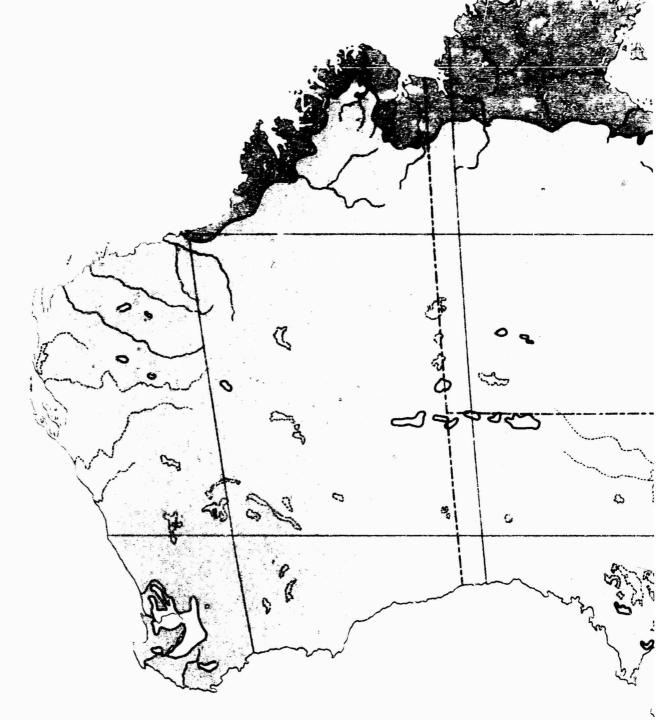






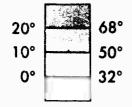
MAP 67

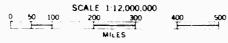




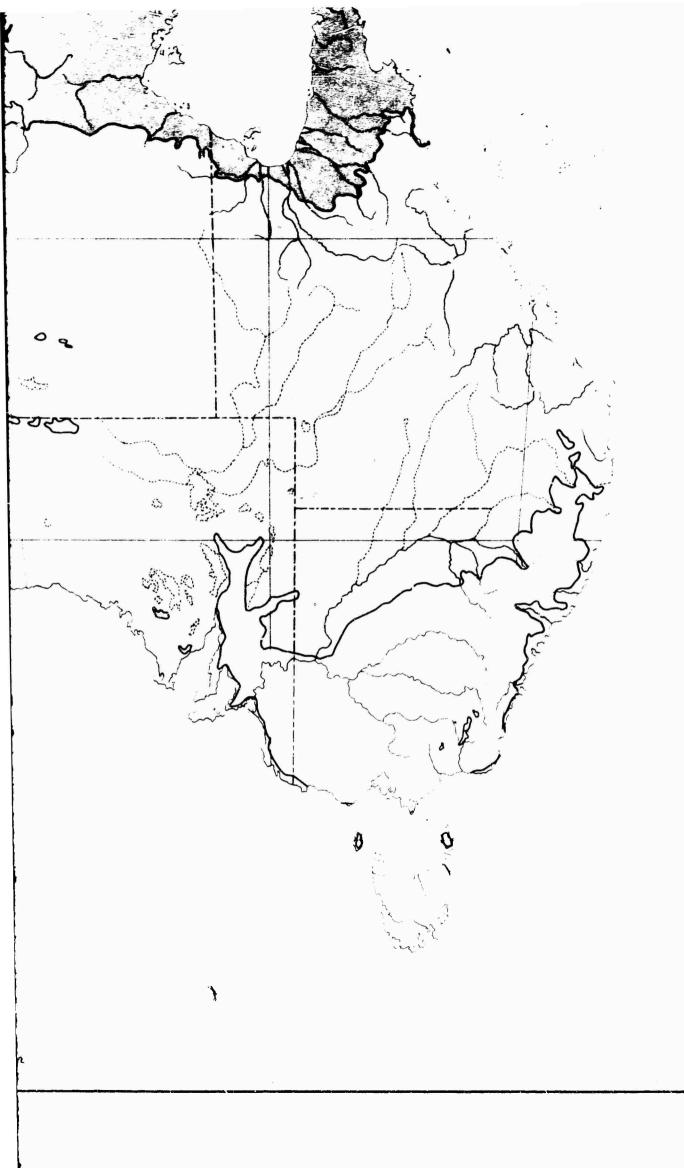
MEAN TEMPERATURE JULY

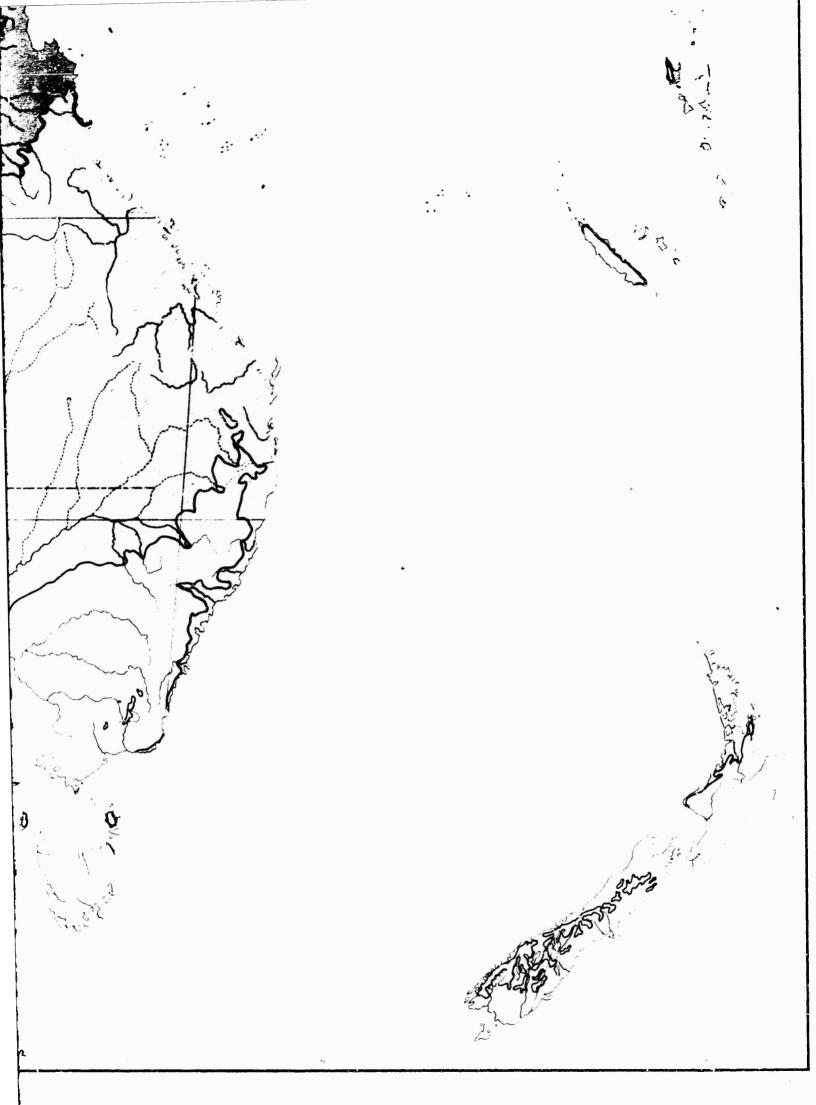
CENTIGRADE FAHRENHEIT

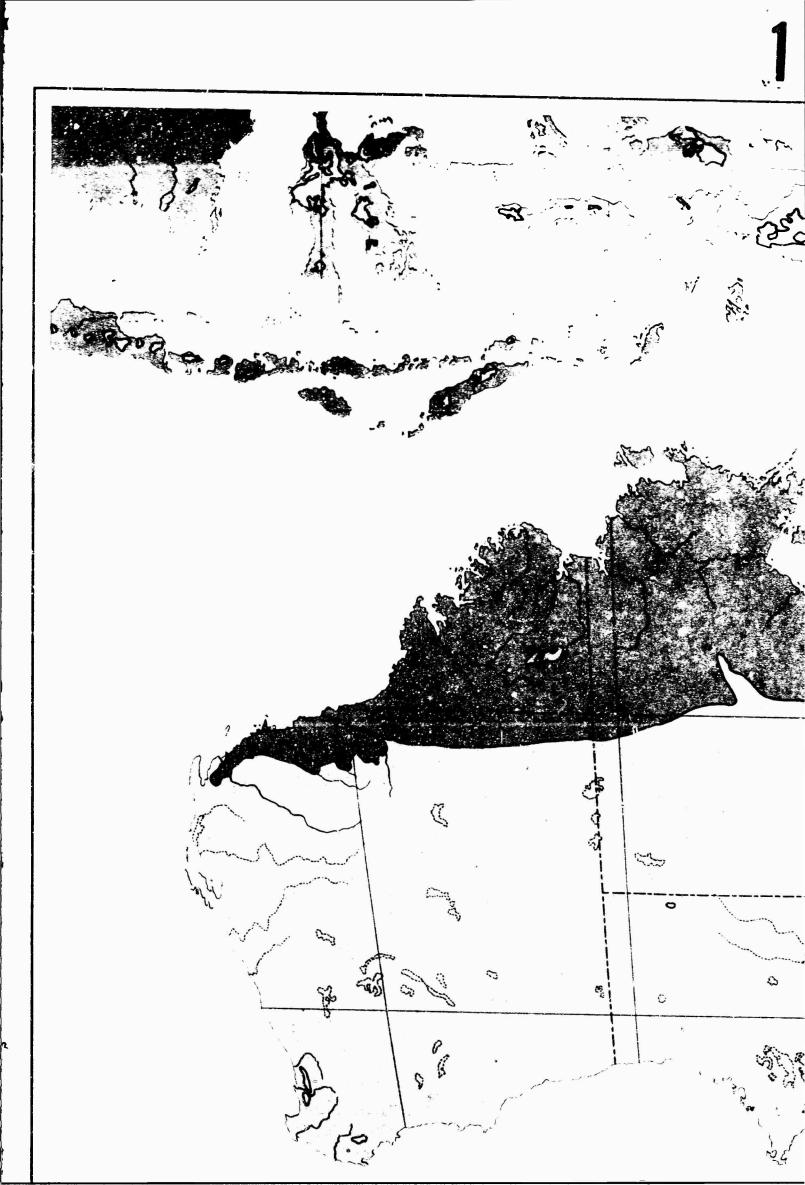


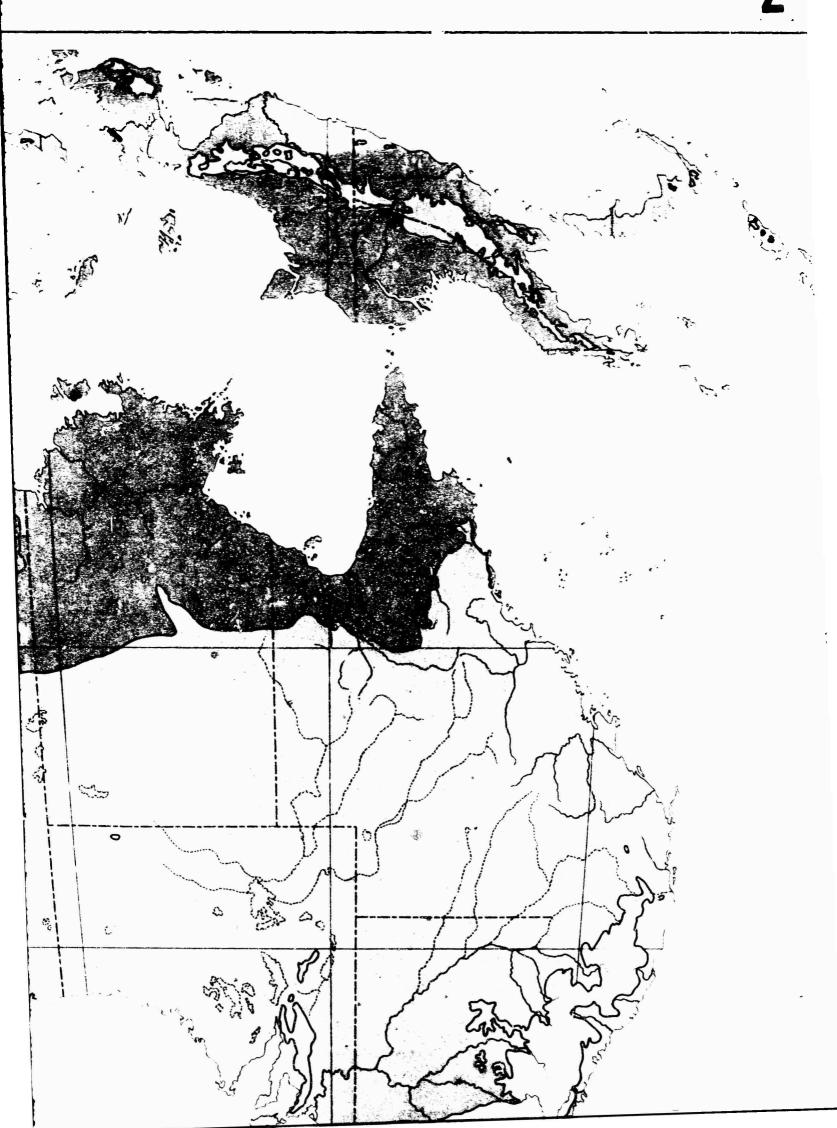


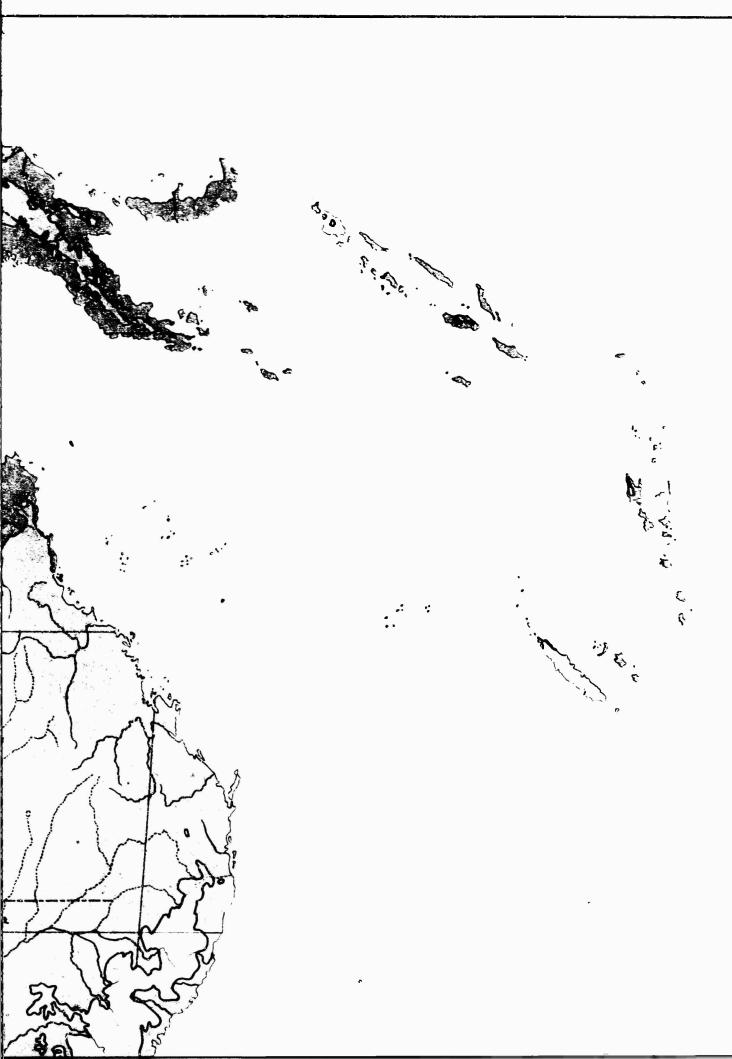
SINUSOIDAL PROJECTION

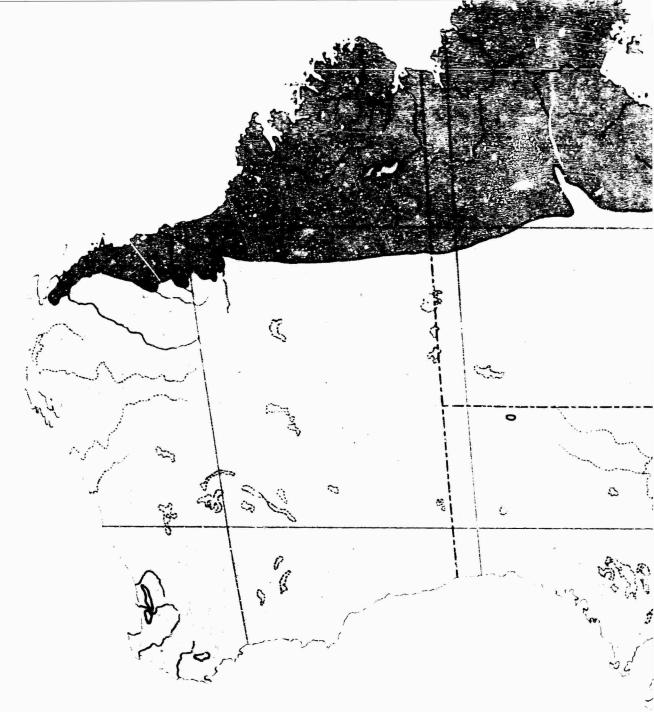






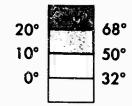






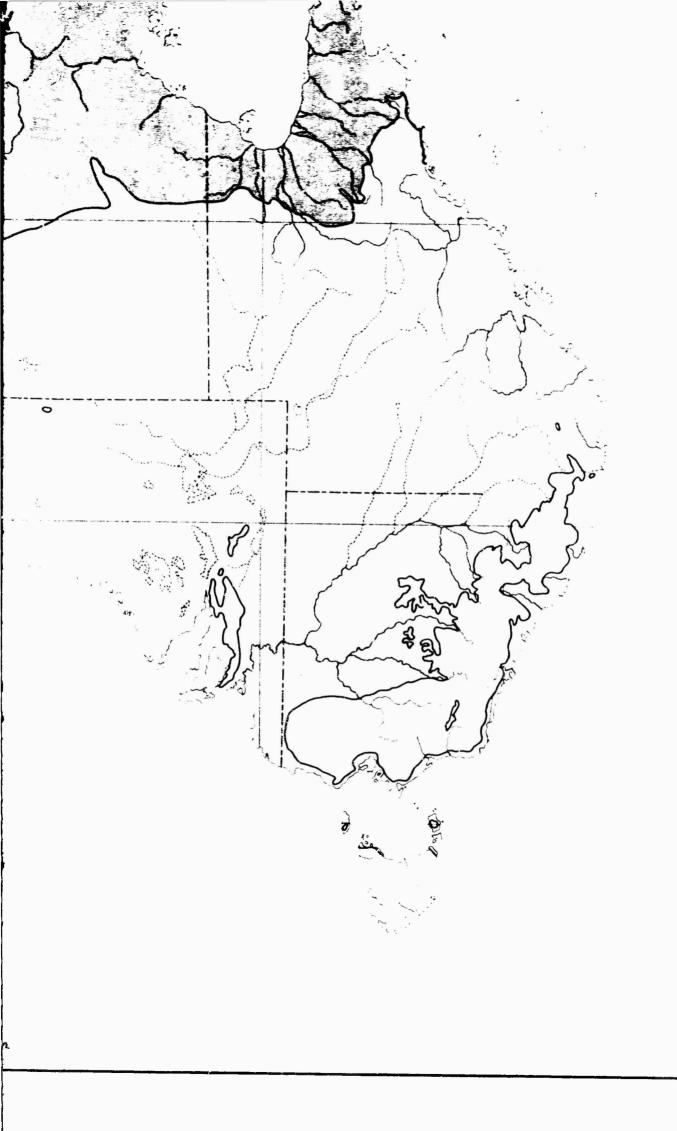
MEAN TEMPERATURE AUGUST

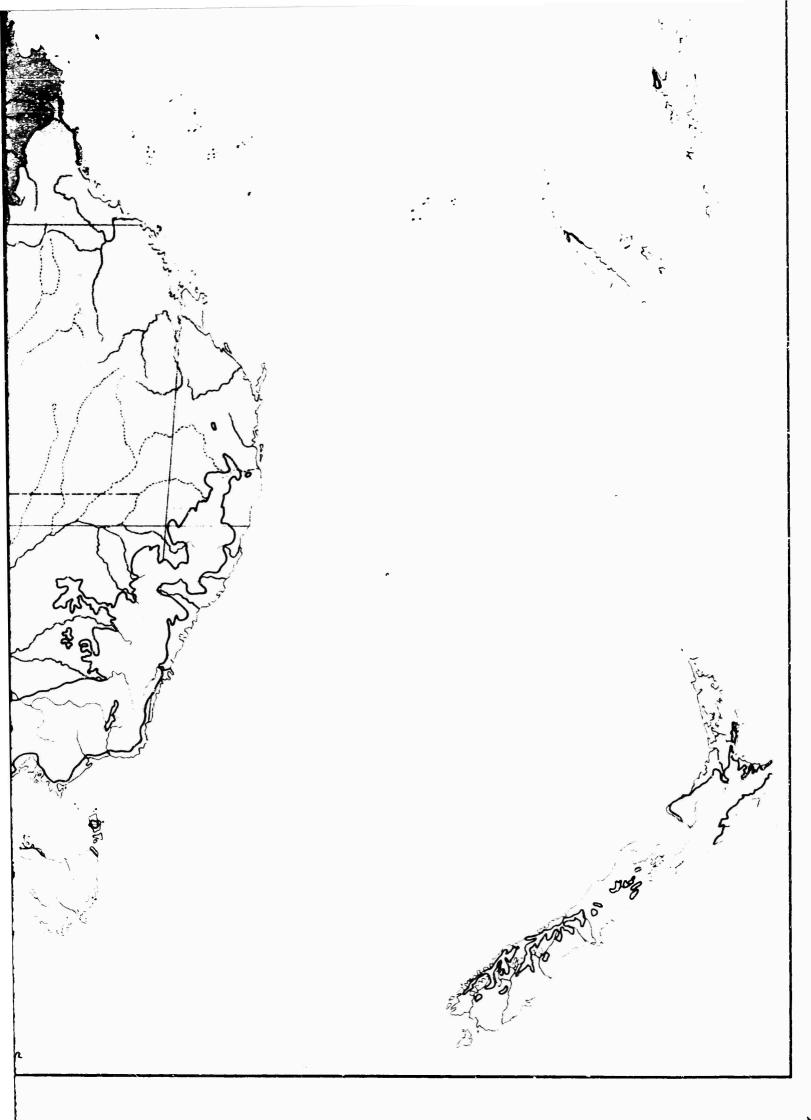
CENTIGRADE FAHRENHEIT

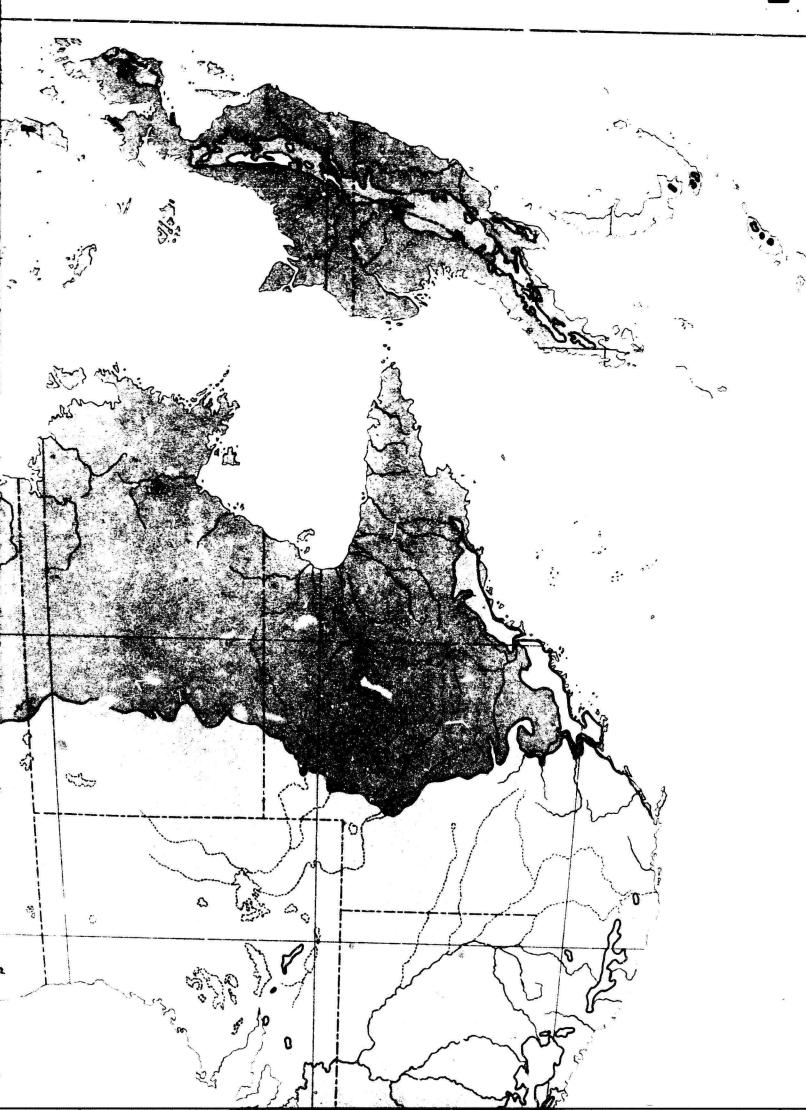


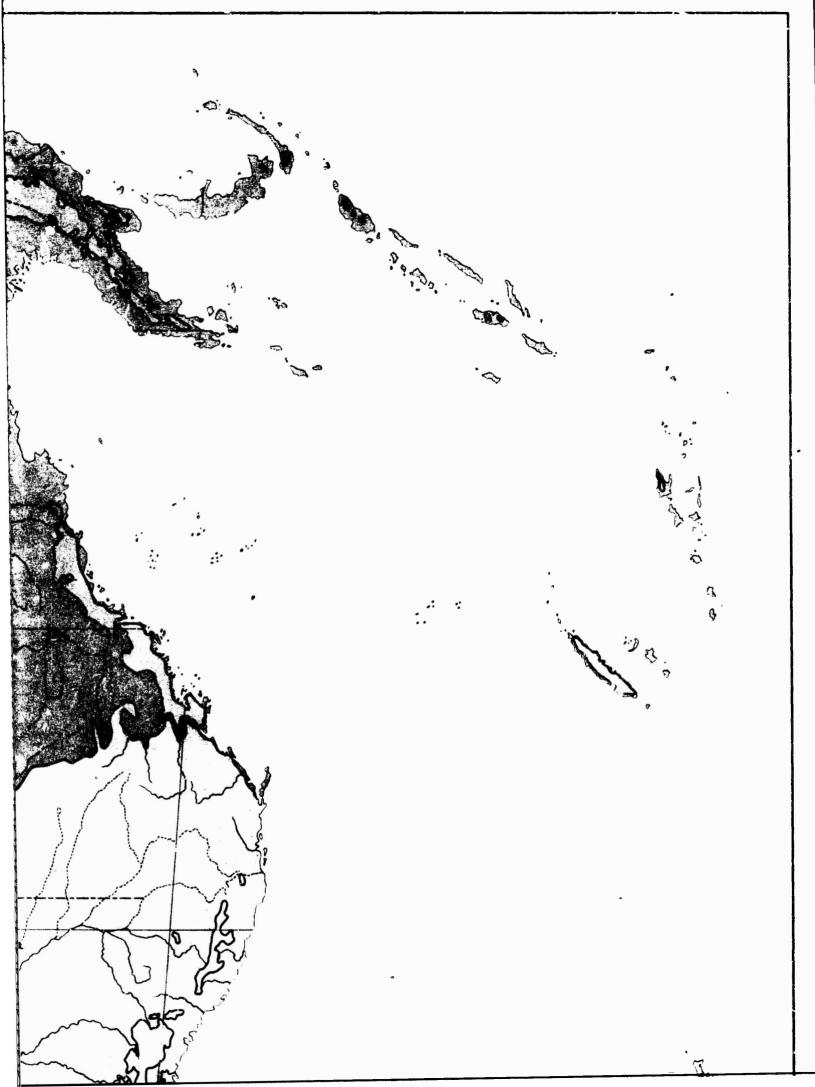


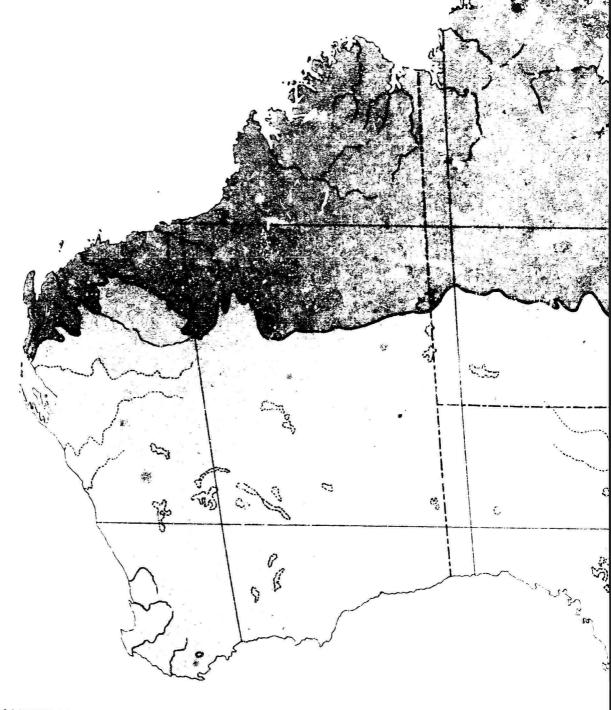
SINUSOIDAL PROJECTION





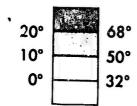


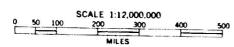




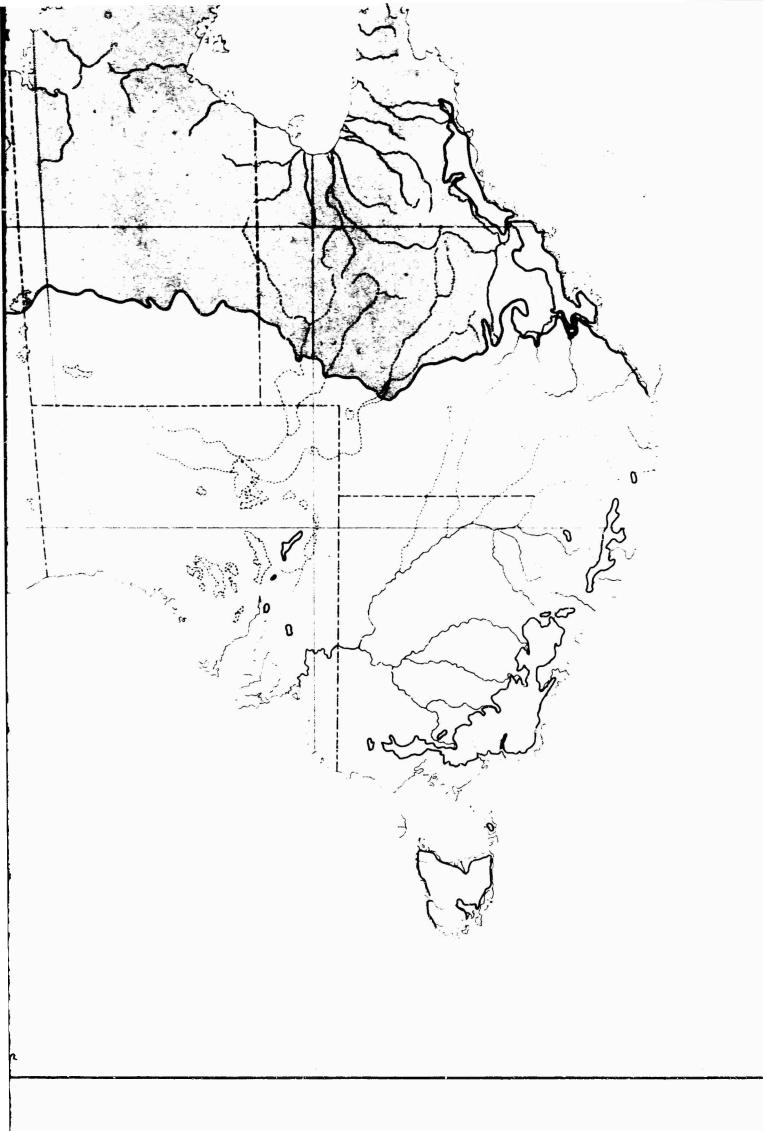
MEAN TEMPERATURE SEPTEMBER

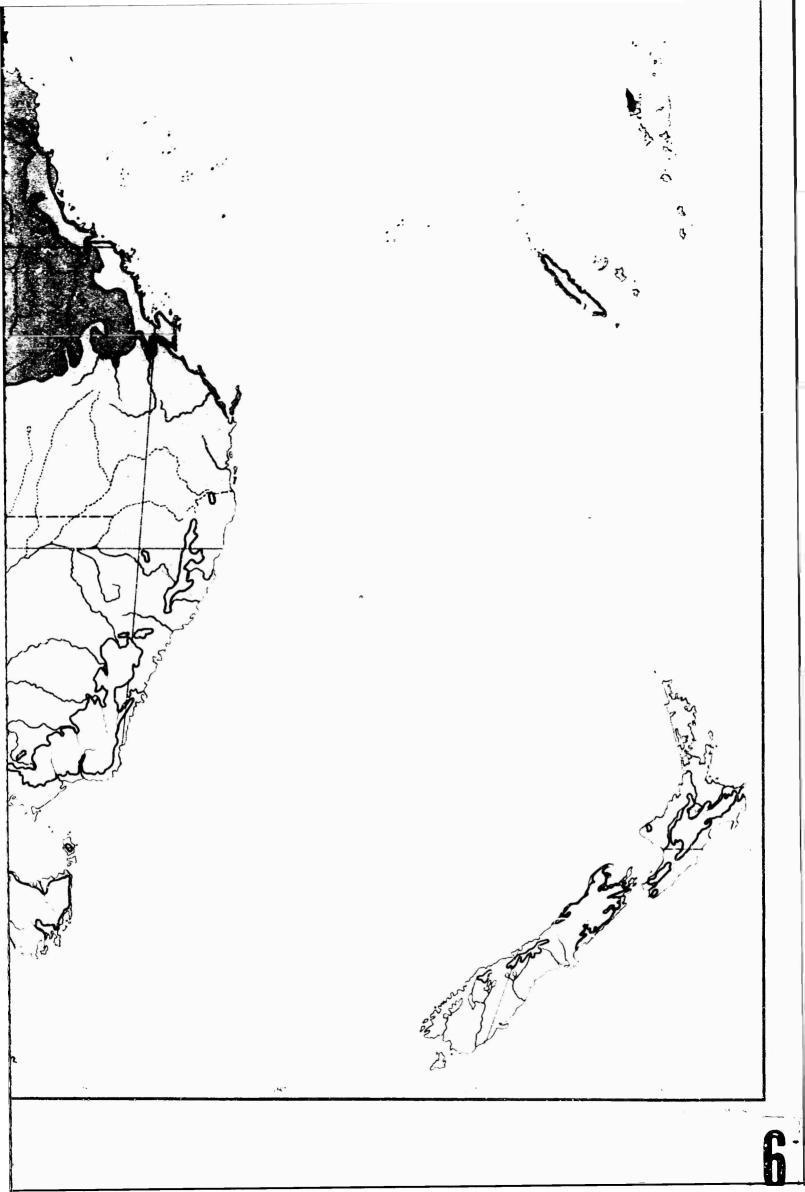
CENTIGRADE FAHRENHEIT

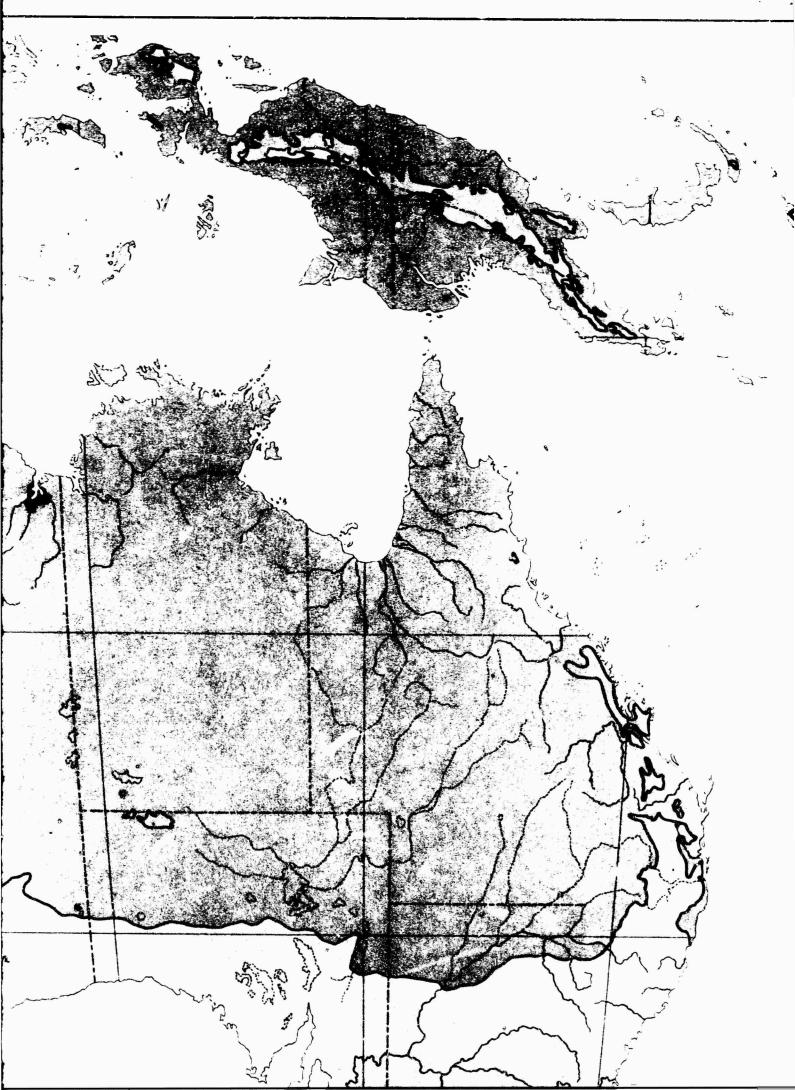


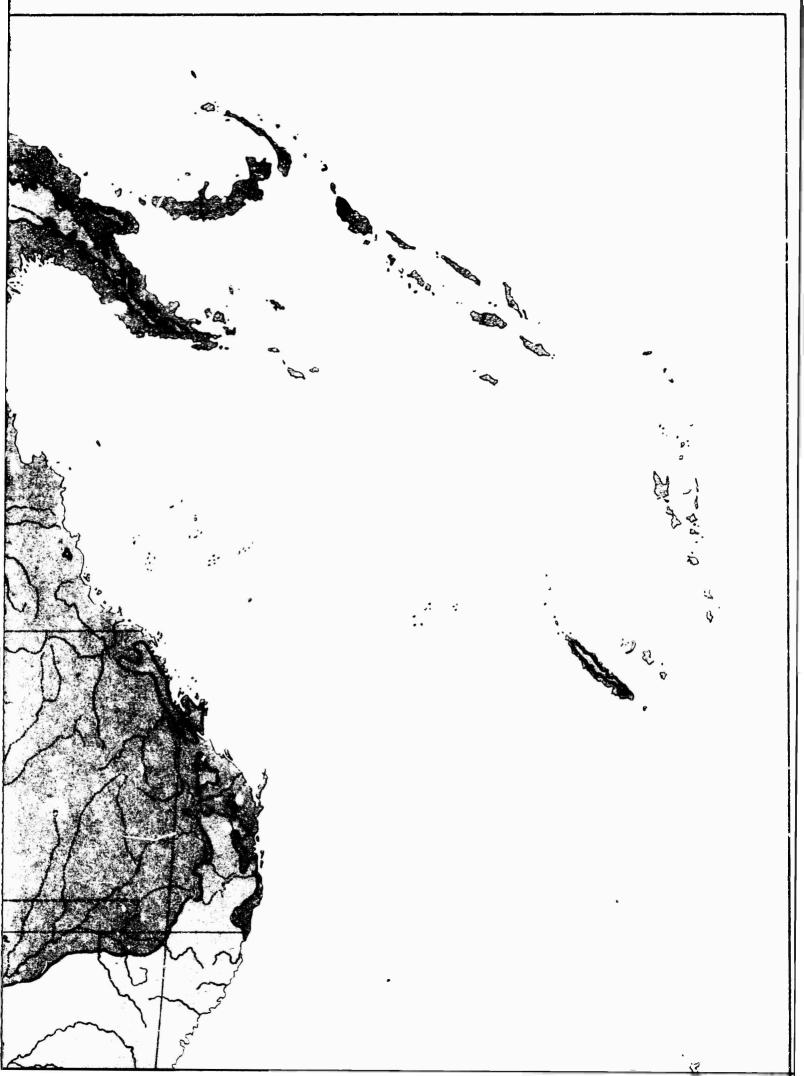


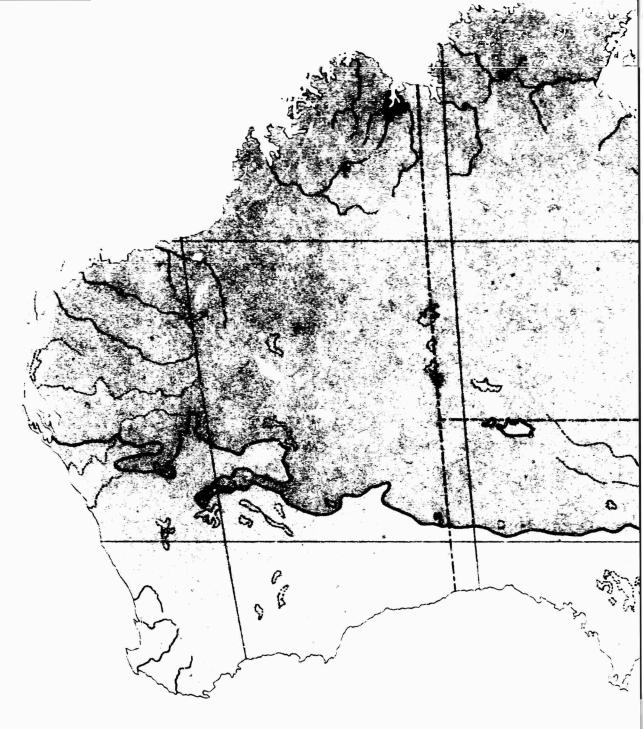
SINUSOIDAL PROJECTION





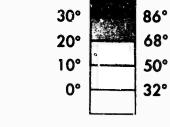


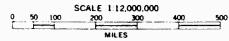




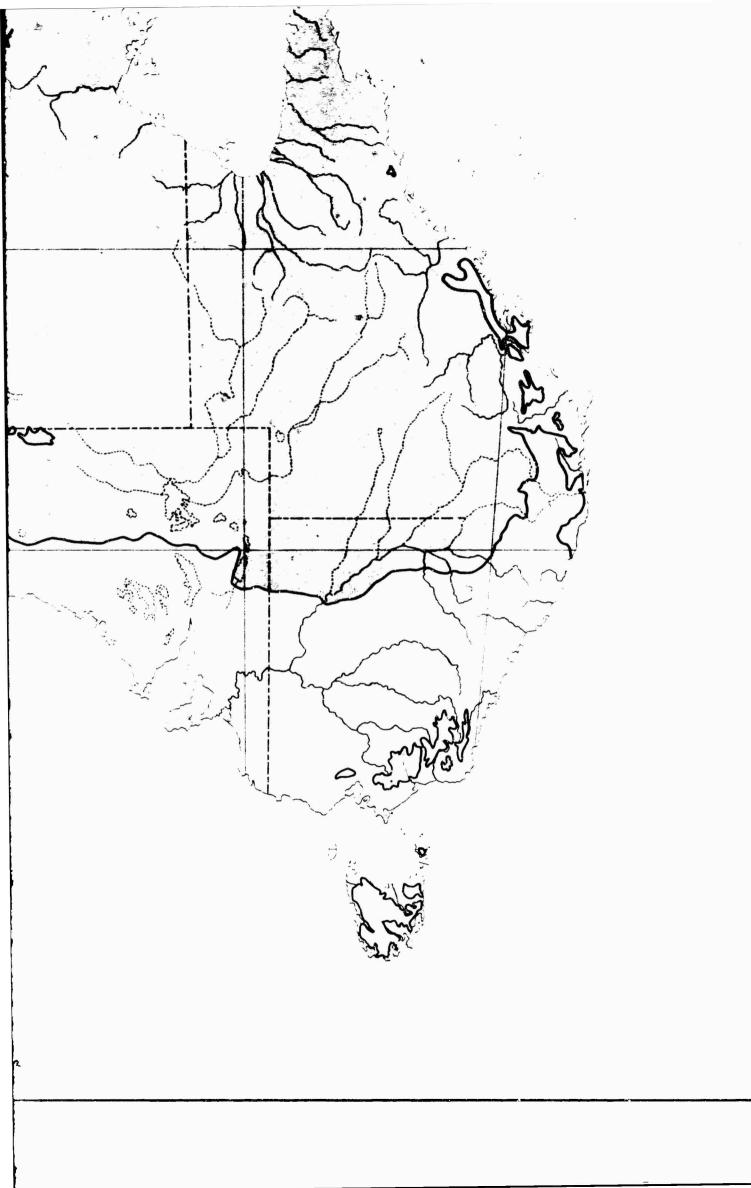
MEAN TEMPERATURE OCTOBER

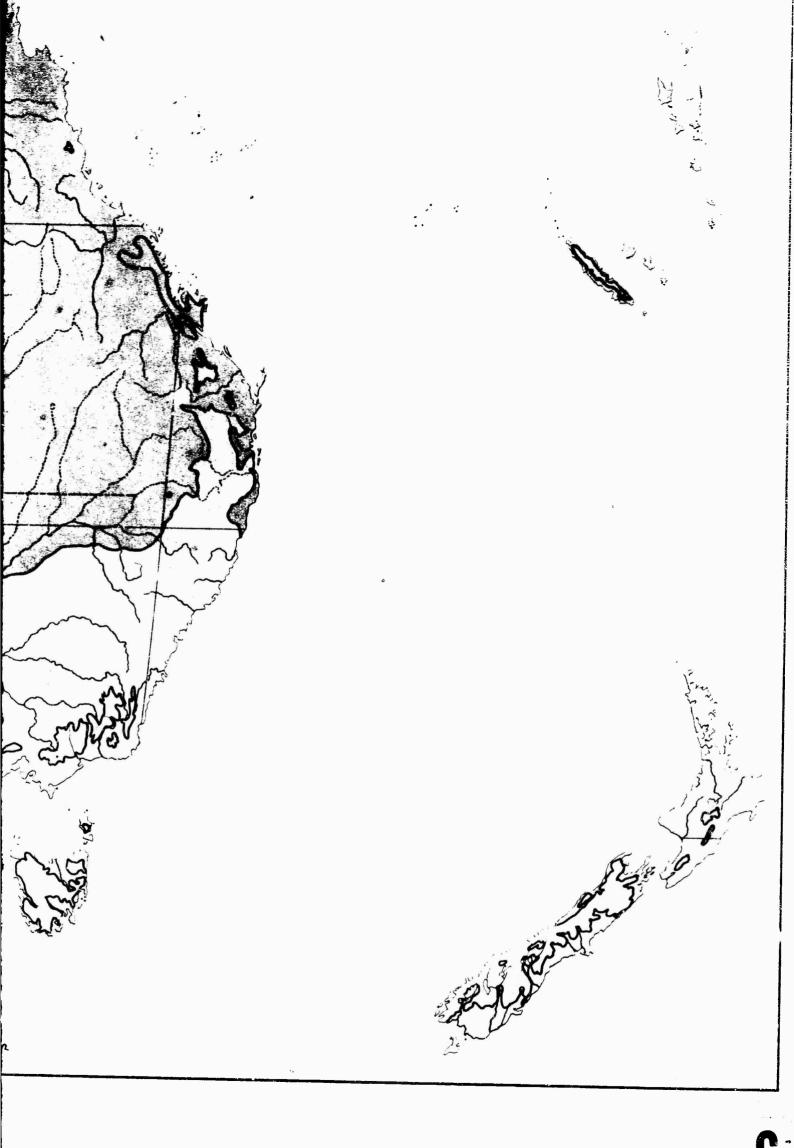
CENTIGRADE FAHRENKSIT



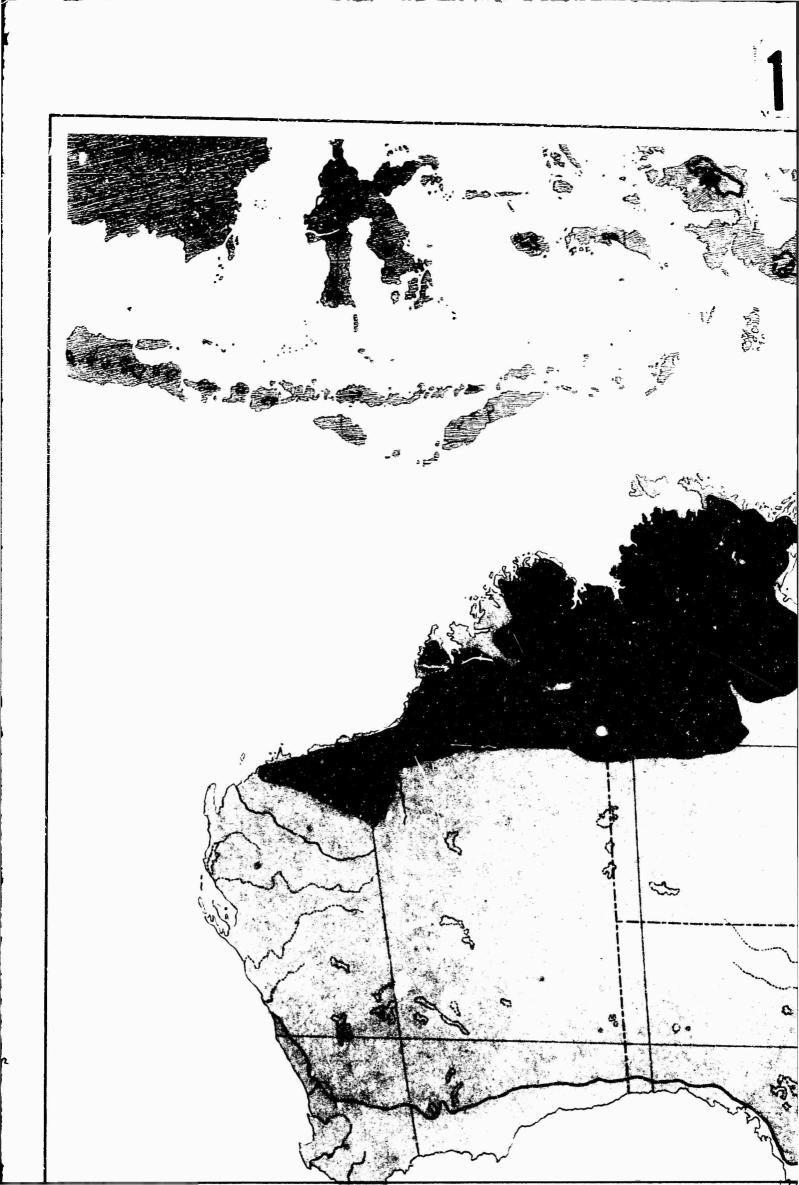


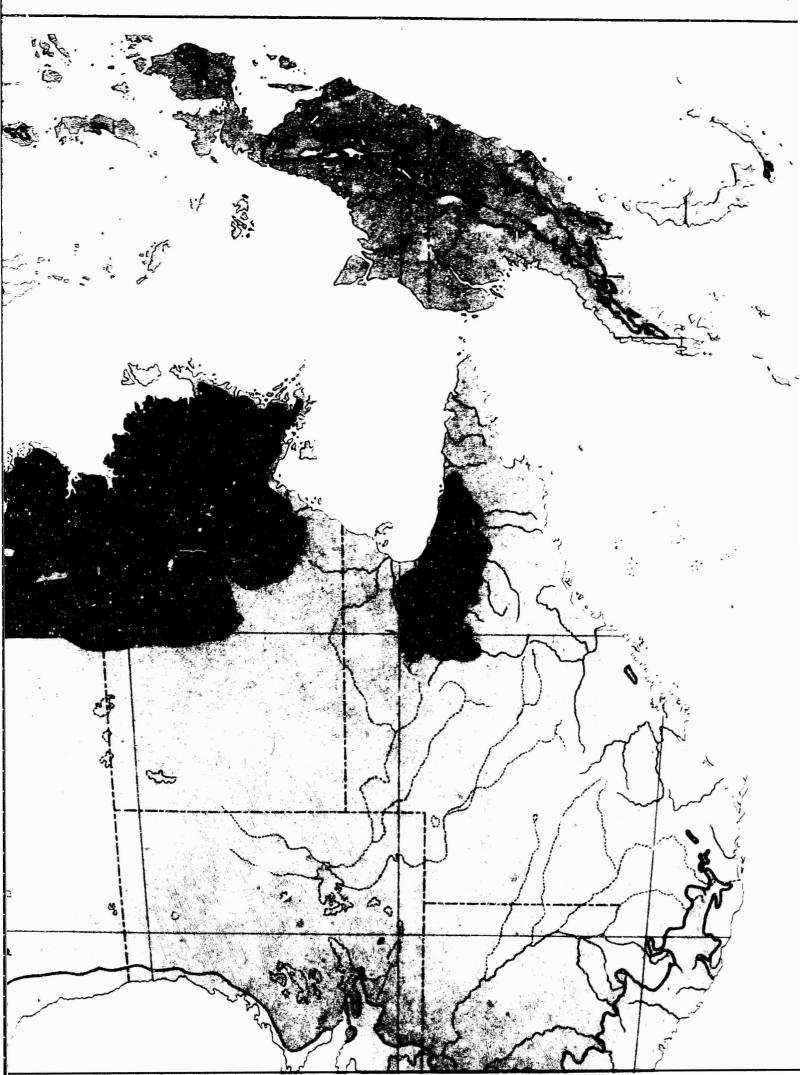
SINUSCIDAL PROJECTION



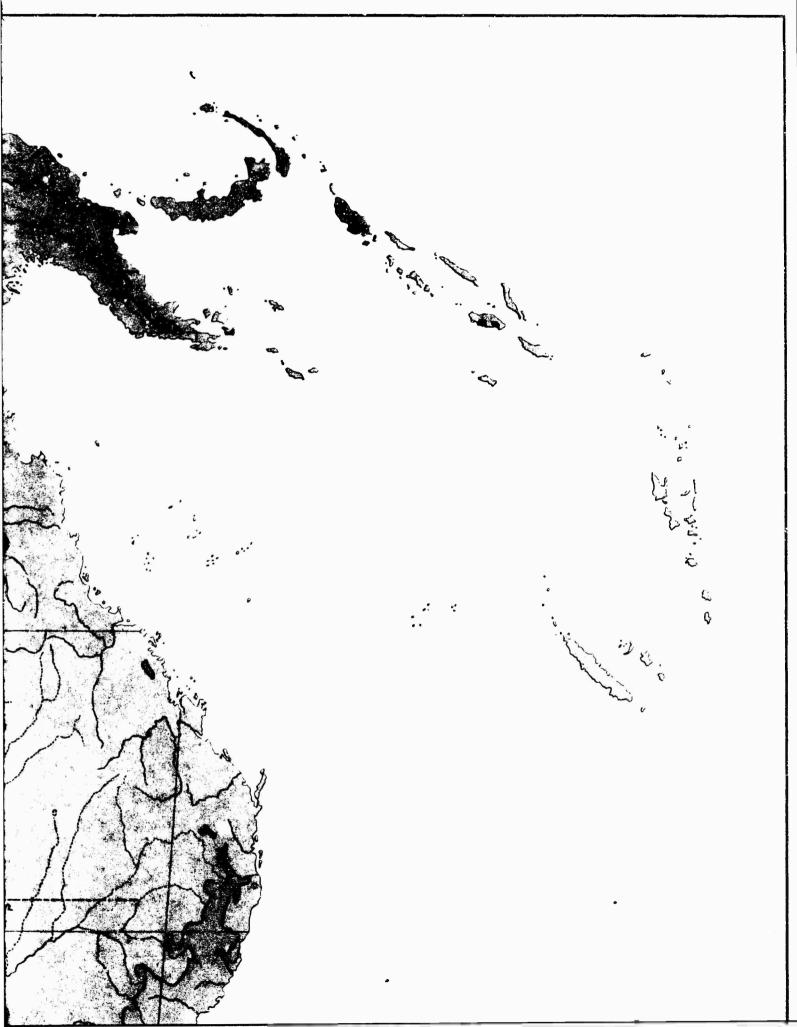


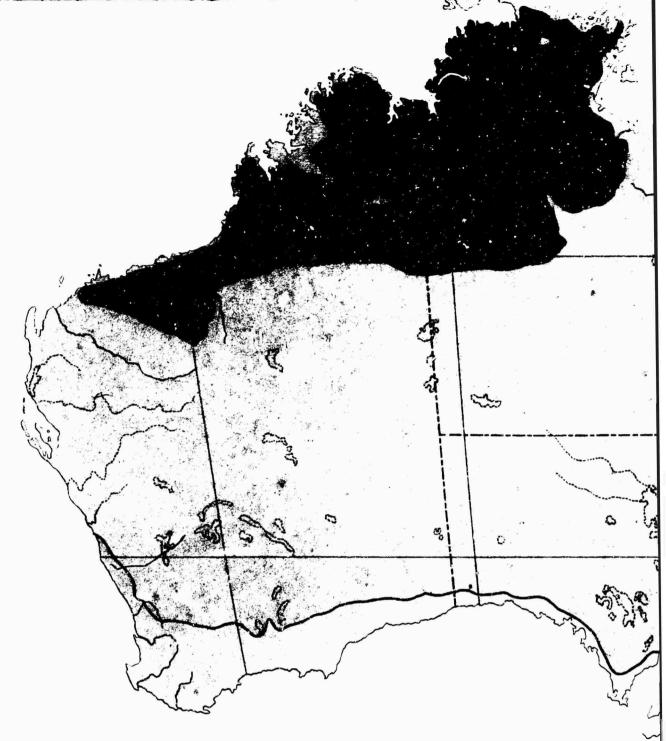
G





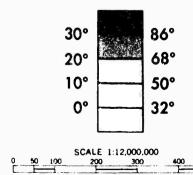
MAP 71



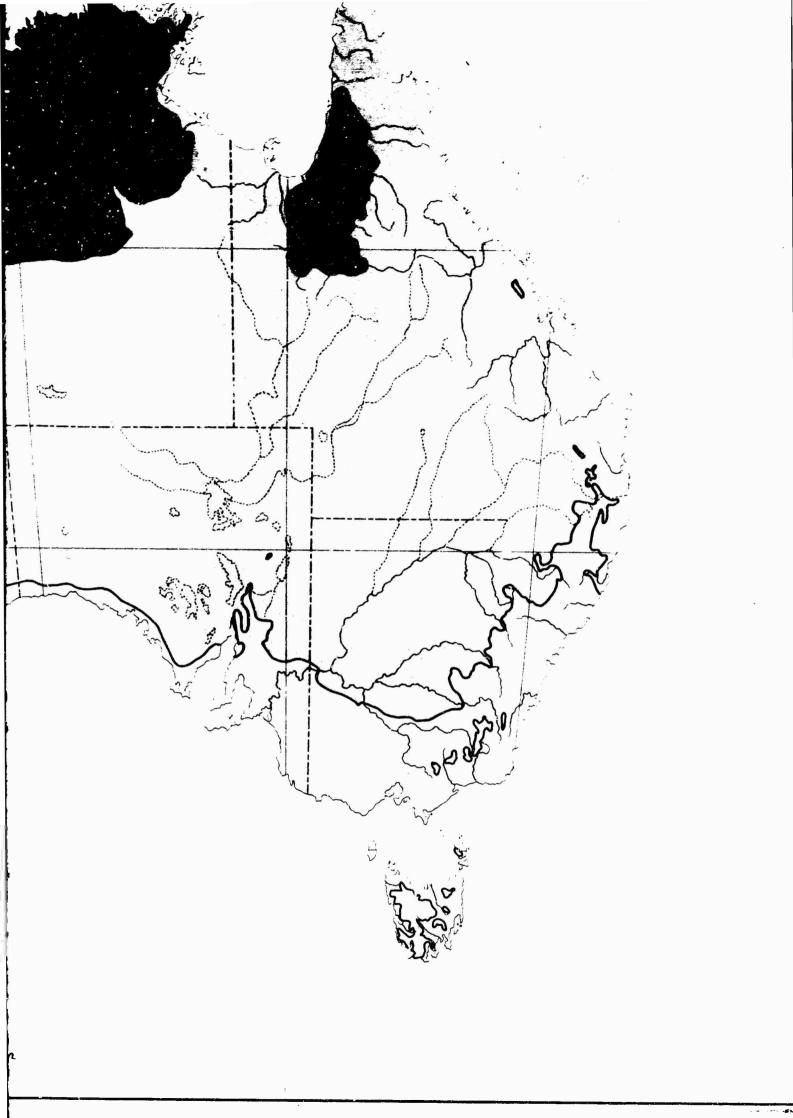


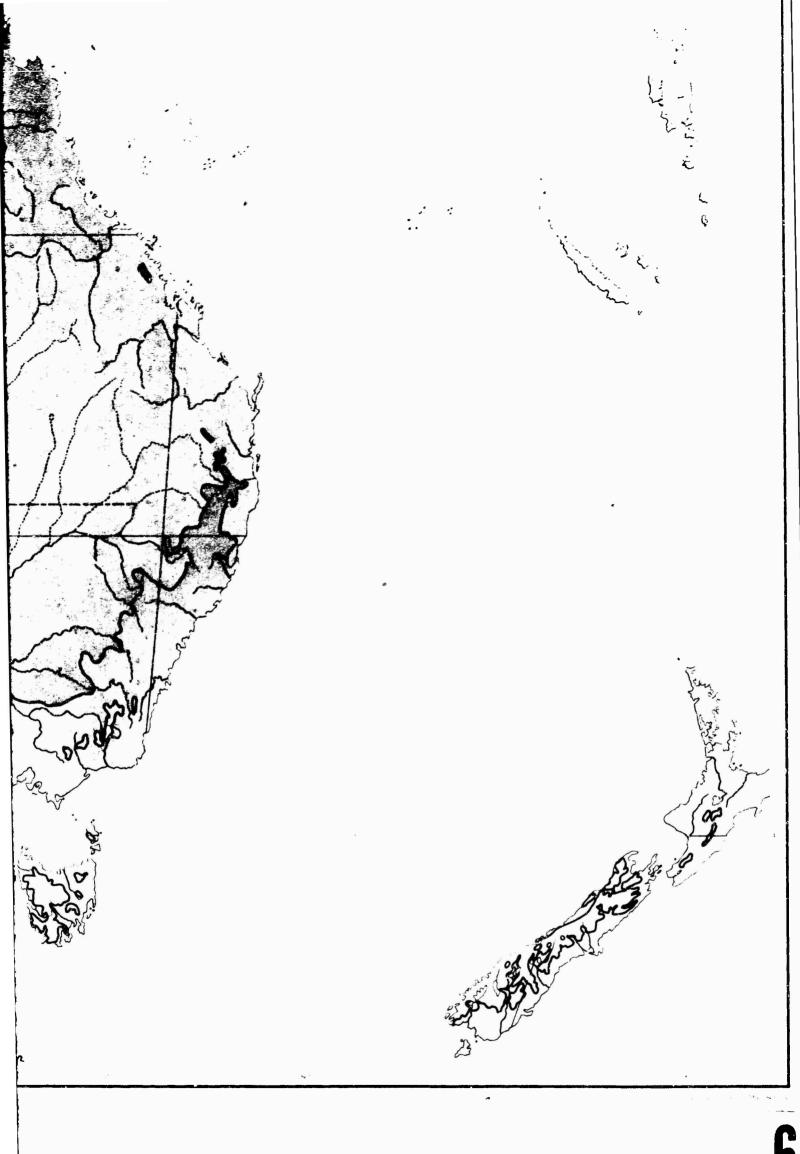
MEAN TEMPERATURE NOVEMBER

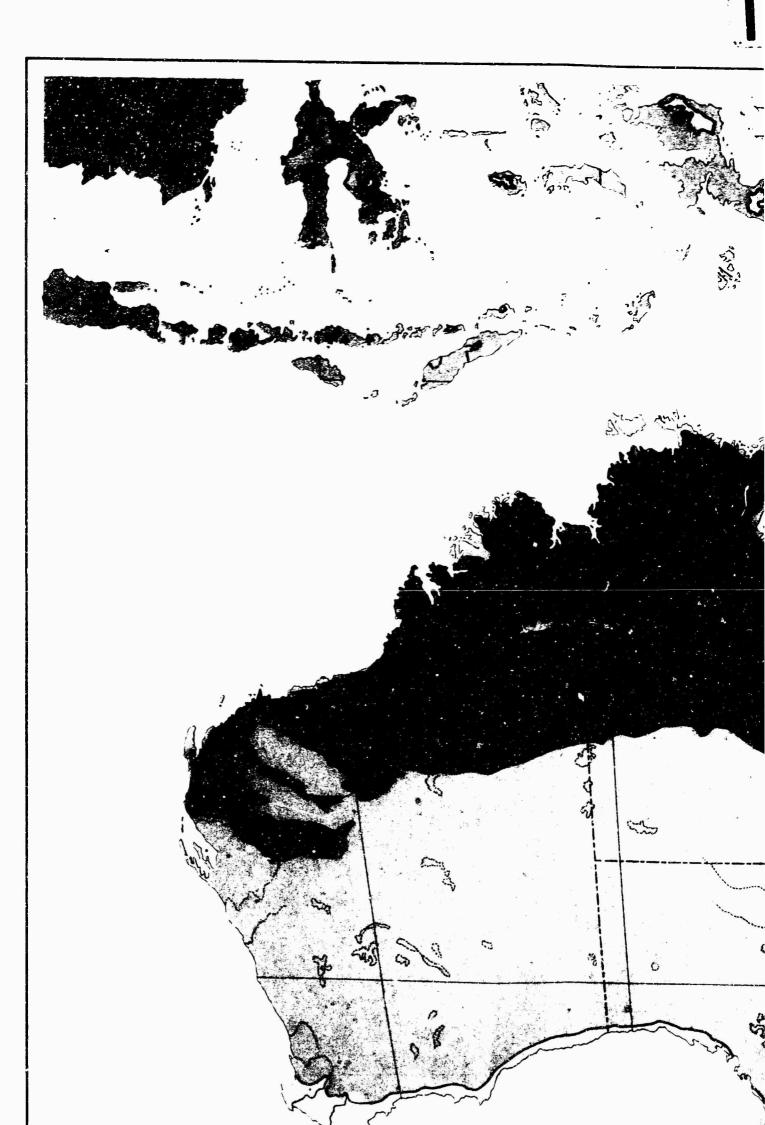
CENTIGRADE FAHRENHEIT

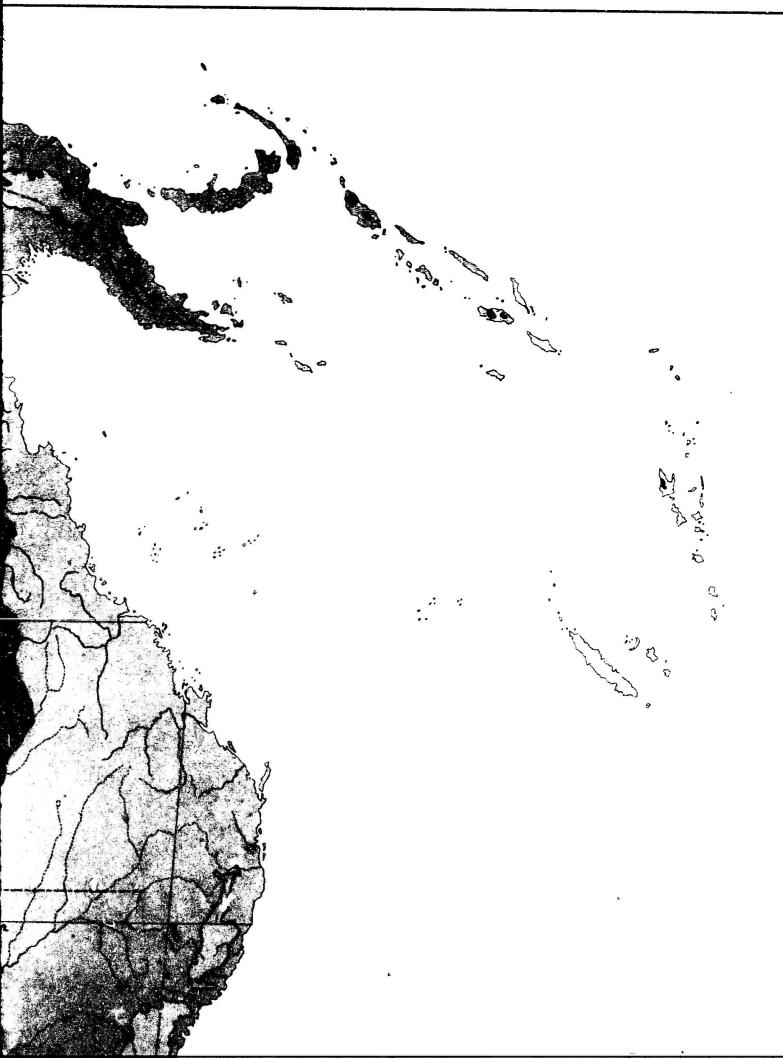


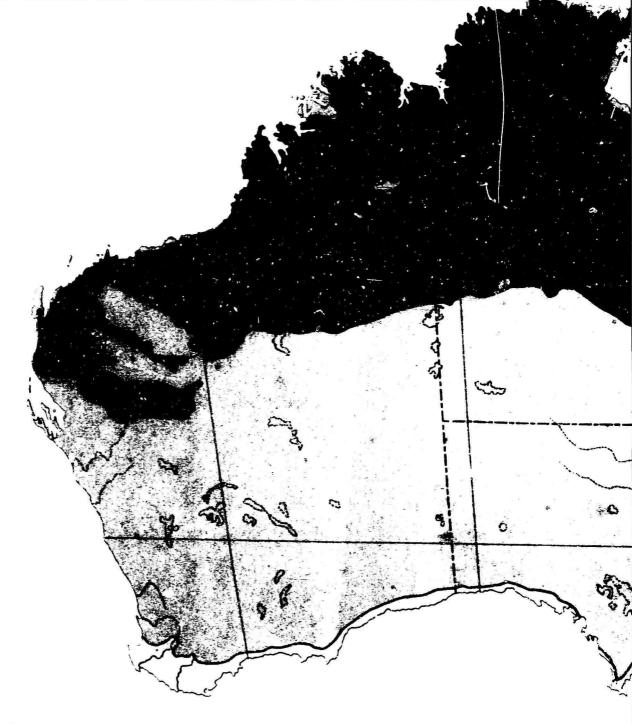
SINUSOIDAL PROJECTION





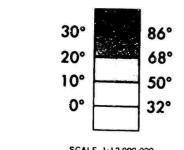






MEAN TEMPERATURE DECEMBER

CENTIGRADE FAHRENHEIT



0 100 200 300 400 500 MILES

SINUSOIDAL PROJECTION

THE DELINEATION OF INTERNATIONAL BOUNDARIES ON THIS MAP MUST NOT BE CONSIDERED AUTHORITATIVE

4

